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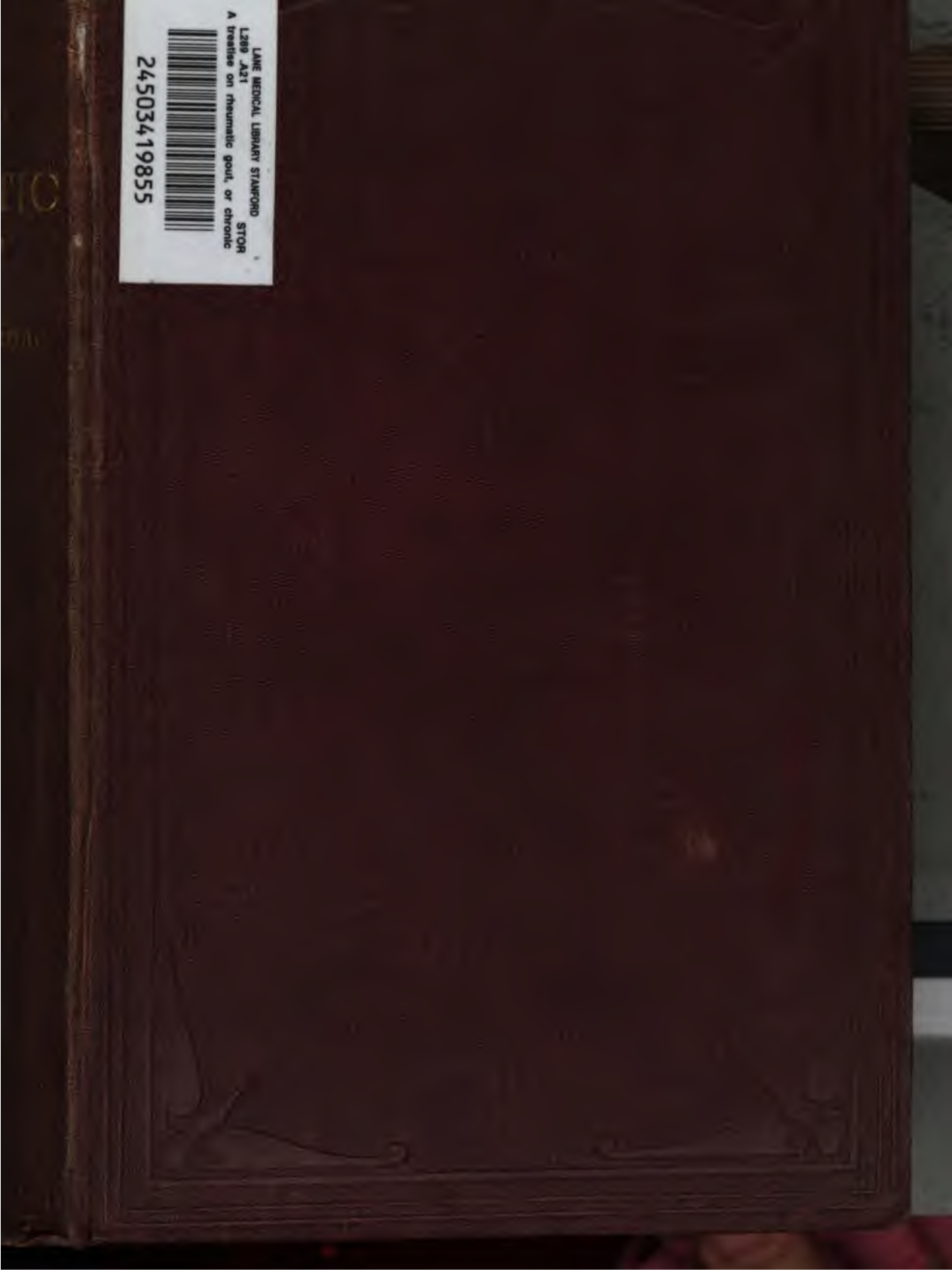
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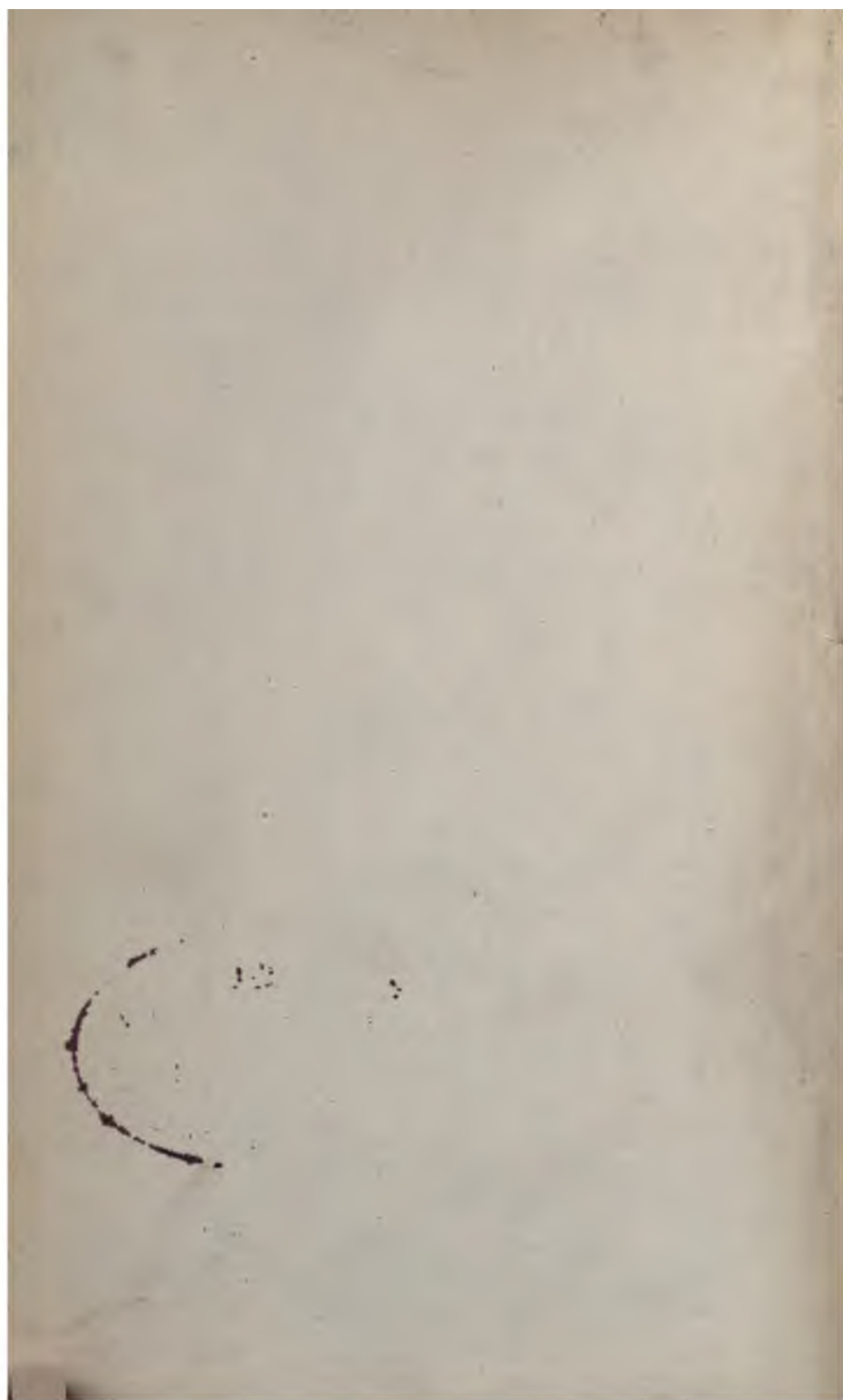
**The New York Academy of Medicine.**



By

**The Society of the New York Hospital,**

**March, 1898.**



5680

A TREATISE

ON

RHEUMATIC GOUT,

OR

*CHRONIC RHEUMATIC ARTHRITIS OF  
ALL THE JOINTS.*

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BY

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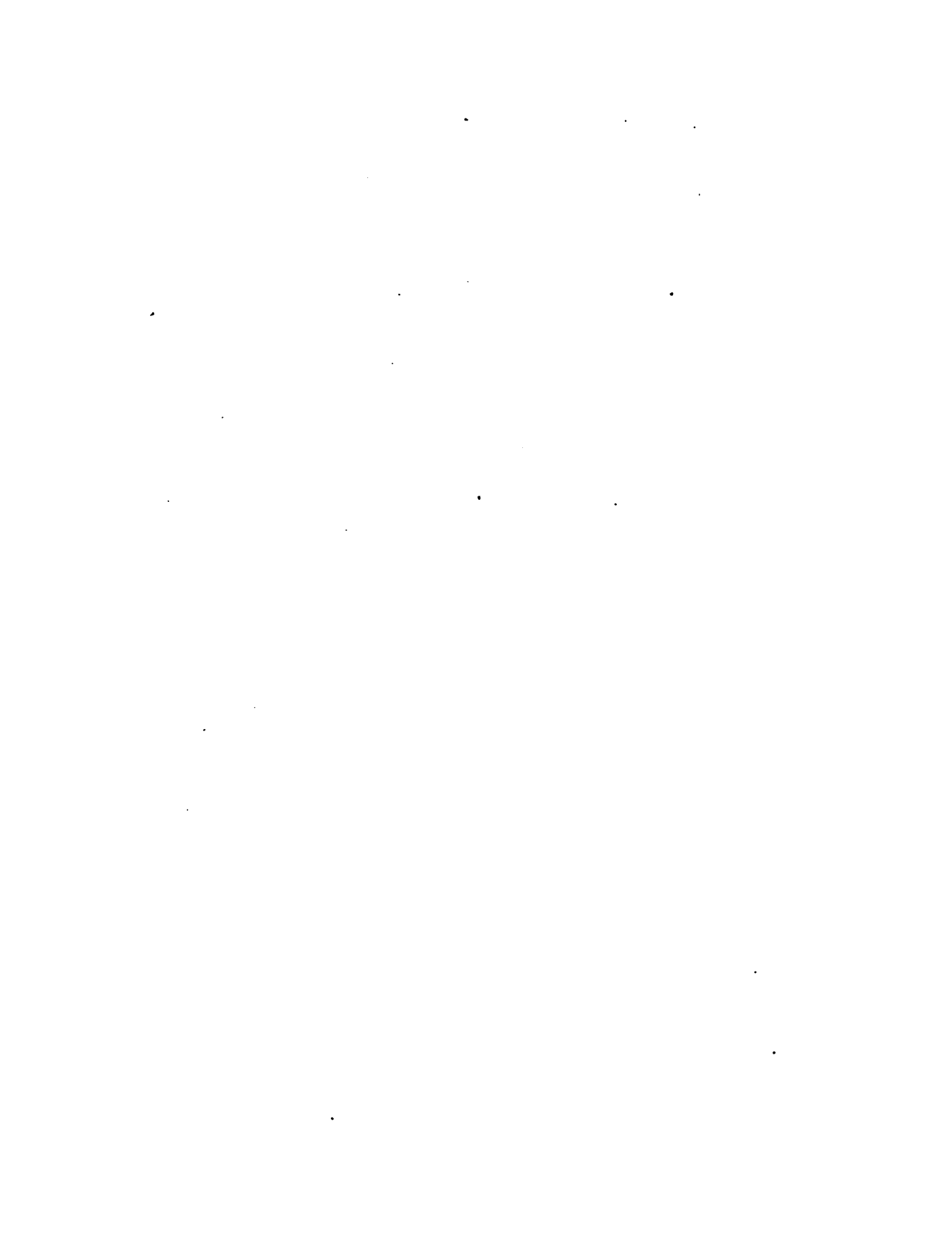
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Y S A S A I S A I

"There is one painful and troublesome disease of the joints, of a peculiar nature, and clearly distinguishable from all others by symptoms manifestly different from Gout, and from both Acute and Chronic Rheumatism."—HAYGARTH.

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A21  
1873

TO THE  
*PROVOST AND SENIOR FELLOWS*  
OF  
TRINITY COLLEGE, DUBLIN,  
*This Work*  
IS INSCRIBED,  
AS A MARK OF THE SENSE THE AUTHOR ENTERTAINS  
OF  
THE HONOR THEY HAVE DONE HIM  
IN NOMINATING HIM  
REGIUS PROFESSOR OF SURGERY IN THE UNIVERSITY OF  
DUBLIN.





## P R E F A C E .

---

**H**AVING for a series of years paid much attention to the disease it is the object of the following Treatise to describe ; and having had ample opportunities in the House of Industry Government Hospitals of studying it, not only in the living, but in the dead, I at length venture to submit the result of my investigations, in a Second Edition, to the judgment of the Profession.

This Treatise embodies the substance of the Clinical Lectures\* which for many years I have delivered on the cases of Chronic Rheumatic Arthritis placed under my care in hospital, and it comprises, also, the principal part of various communications I have made from time to time relative to this disease which have been already published. Hence, therefore, although the work contains views with

\* " Il y a en effet, deux manières de faire connaître ses travaux et ses opinions sur quoi que ce soit : les livres à l'impression, ou bien les exposer dans des leçons publiques."—BLANDIN.

reference to this disease having, perhaps, some claim to originality, still it cannot be expected that it will be found to suggest much which can now be considered new, or which has not, either by myself or others, been already laid before the Profession.

As, however, information relative to this disease was only to be acquired by a vigilant search into the reports of Medical Societies, not easily accessible to the student, and in the journals of the day, &c., it has long since appeared to me that a *monograph* on the subject was called for, and hence the publication of the present Treatise.

The pages of the work will be found to be interspersed with numerous woodcuts ; and I have associated with it an Atlas of Drawings taken from remarkable specimens of this disease which our Museums contain.

I am not without a hope that these Drawings, while they may make the necessary details of Cases and Post-mortem Examinations clearer and less tedious than they otherwise should be, may, at the same time, render the professional eye, as it were, more familiar with the general aspect of these abnormal forms, whether noticed in the living patient\*

\* See Drawing, page 257—the first I believe ever published, exhibiting the usual external appearances the ankle, tarsus, and toes present when affected with chronic rheumatic arthritis.

or morbid specimen, and thereby, perhaps, prove the means of preventing errors.

Indeed, it must be confessed that heretofore the diagnosis of this disease, even as to the anatomical characters of it, has been placed on most uncertain foundations, as may appear by referring to numerous cases contained in this volume. To show that such mistakes have not been confined to Great Britain, we may refer to Cruveilhier, who says, "That as bony vegetations form around the articular surfaces as a result of this disease, and as the heads of the bones become depressed, as it were crushed down and deformed, any one unacquainted with the disease would be tempted to believe the bones had been fractured." Indeed, he adds, he has in his experience known such mistakes to have occurred many times in cases in which the hip and shoulder-joint have been the seat of these organic lesions. This author further, as a clinical physician, laments how little this disease was known, and adds that he felt "persuaded that it was habitually confounded with gout, rheumatism, and even white swelling, and that it was often combated by very active treatment, the inutility of which he believed to be the least of the evils attending it."\*

\* "Anatomie Pathologique." Par J. Cruveilhier. Livraison ix. page 10.

I trust it will be found that in this volume, whether the disease is considered as it presents itself in the hip, shoulder, knee, or any other of the articulations whatsoever, the anatomical characters and the symptoms of it are fully given, and the means of diagnosis pointed out, and on this account the work may become useful to the young practitioner. I believe it will be admitted that the proper steps which should have been taken, previously to our venturing to touch on the principles of treatment of this disease, have been those which we have adopted here, namely: first, to have determined what were the symptoms, diagnosis, and anatomical characters of the disease, before we could have hoped to have made a successful inquiry after the most proper method of treatment.\*

Although the observations, with reference to the anatomical characters, have been published in the first edition, 1857, they seem to me to have attracted but little notice, as we find modern writers still lament the want of information relative to the morbid anatomy of this disease, observing "that the opportunities of examining the Pathological condition of the joints affected by this disease are only of occasional occurrence."

The facts, however, alluded to here, as already

\* Baillie's "Morbid Anatomy," Preface, page 2.

published, have not been ignored by all. One modern writer on rheumatic gout declares, the morbid anatomy of this disease has been carefully studied by some Pathologists, especially by Dr. Adams, whose results, he adds, he will endeavour to give in a small compass.\* The other, a labourer in the same field, has been kind enough to say, "For beautiful illustrations of changes produced by this disease in the joints, see the Atlas which accompanies Dr. Adams's work on rheumatic gout."†

Although it is now many years since the first edition of this work has been published, my continued study as to the morbid anatomy of it has not enabled me to add anything to the description and delineations already given. I have in this edition increased the number of wood engravings, with a view to make us more familiar with the variety of external forms the disease imposes on the parts it affects. I have increased the size of the volume, and trust also the practical value of it. A chapter on *Bursal Tumours*, symptomatic of rheumatic gout, followed by an account of simple Bursal Tumours not symptomatic of any special disease has been introduced, and questions as to the

\* Garrod, page 539, Second Edition.

† Fuller, page 340, Third Edition.

comparative value of a variety of modes of treatment have been discussed.

I am ready to admit that, after all, the great desideratum at present required of us is to answer the question, what is the best method of treating Chronic Rheumatic Arthritis? To this question it must be confessed we cannot give as satisfactory an answer as we could wish. Modern observers, while they admit the difficulty of effecting a cure in cases (when the disease has once been fully established), affirm that much may be done in the way of palliating the symptoms of this chronic disease. Frequently treatment has proved useful to restore the patient so far, as to render him able to resume the ordinary business which heretofore occupied him, and by means of which, perhaps, he has been enabled to live as he had done previously to his having been affected by Rheumatic Gout.

A brief inquiry into the history of the treatment of this disease will inform us that Haygarth, who first described it in 1805, so far as its external symptoms were concerned, seems to have contemplated the treatment of it in a twofold point of view, and to have adopted a twofold species of treatment, one of which might be called curative and the other palliative only. He gives the history of one case,

which although established for years, yet was perfectly cured by treatment.\*

Sir Benjamin Brodie,† in his edition of 1850, has expressed his opinion that something can be done just in the commencement, before any disorganization has taken place, in preventing its further progress, yet he appears by no means sanguine in his promises of being enabled to do more than to palliate the disease. He says, that if rheumatic gout be treated in the very earliest stage of the disease, it may, after having reached a certain degree of improvement, become stationary.

I have given abstracts of the opinions of more modern authors, as to the treatment of this disease, in this second edition, such as those of Drs. Fuller and Garrod (see page 316). The latter, in the edition of his work in 1862, says: "It must be confessed that, in the department of treatment much still is to be achieved, but at the same time much good may even now be accomplished." Both of these authors, in their account of rheumatic gout given in the latest editions of their works, seem by no means desponding when they speak of the treatment of it, when the disease is attended to early; and each of them adduces

\* Haygarth, *loco citat.*, pp. 301-2.

† Brodie "On the Joints."

several examples proving the benefit to be derived from treatment early and judiciously applied.

And as to this point, the author can, with confidence, refer to such cases herein given, as those of Lady K.,\* M. Leonard,† James Foley,‡ as examples, proving that treatment has been found so far satisfactory as to have enabled patients to resume completely the ordinary business or pleasures which had occupied them previously to their having been affected with Rheumatic Gout.

With reference to this last class of examples of Rheumatic Gout, I should not omit to allude to the case of Eliza Fisher, aged 50, who was admitted under my care into the Richmond Hospital on the 6th of July, 1866.§ Almost all her joints, except those of the hip and shoulder, were symmetrically affected with Rheumatic Gout ; she was for six months in hospital, and subjected to treatment by hydriodate of potass. She also took warm baths at a high temperature, and at the termination of six months she left hospital, as she felt herself well able to resume her duties as a thorough servant, and has continued to be employed in this capacity at 17, Wellington-road, up to the present time, a period of six years. She called upon me some time after

\* p. 319.            † p. 259.            ‡ p. 419.  
§ No. 306, Registry, Richmond Hospital.



she left the hospital, and said, that although she was wonderfully well, and quite competent to keep her place as thorough servant, that she still complained of a degree of stiffness she felt in the joints of the lower limbs. I observed to her, that she had when in hospital derived benefit from the use of warm baths at a high temperature, and that therefore I would strongly urge her to subject herself to a thorough course of treatment with Turkish baths. She called accordingly upon Dr. Barter, at his establishment in Sackville-street, and during the autumn of '67 as well as that of '68, she gave a full trial to these baths, and derived such benefit from their use, that the stiffness quite left her joints, so that for the last two years she has not had any occasion for baths or any other treatment. Finally, I may here mention that it so happened, that on the 29th of August, 1872, she had unfortunately, in performing her duties as servant, received a wound in her wrist from broken glass, and called upon me. I desired Mr. Walker, the then Senior Resident of the Richmond, to remove the glass, which he did accordingly. Her appearance at the hospital on this last occasion afforded me an opportunity of witnessing how complete was the recovery of the *use* of all her limbs; a painless nodosity of some of the joints of the fingers remained, testifying that

she had once severely suffered from Rheumatic Gout.

The task of preparing for the press the present work has occupied me many years, having been often interrupted by various other professional avocations ; and I fear that it should not have been even yet accomplished, were it not for the assistance of many friends. Among these I must first name Professor Smith, who has been much associated with me in prosecuting most of the post-mortem examinations which have been brought forward to illustrate the anatomical characters of this disease. It will be also found, in reading this Treatise, that I have largely quoted many of the valuable observations on this disease that the Professor has himself already published.

I should not omit to mention that I have been under much obligation to many of the resident pupils of the Richmond Hospital, who attended to the cases under my care in hospital during my necessary absence. Among those pupils I may mention the names of Mr. J. P. Doyle, Mr. Martin, Mr. Harman, W. P. Browne, H. F. Adams, W. J. Fawcett, Mr. Thompson, and Mr. A. Vesey (who was senior resident pupil for two years)—as well as his successor, Mr. Walker.

The woodcuts have been executed, as to the first

half of the volume, by Mr. Hanlon, and the remainder by Mr. Oldham, and will, I think, be found to do credit to the established character for skill of these artists. As to the lithographic drawings, I leave them to speak for themselves. They have been printed by the late firm of Hullmandel and Walton, of London ; and drawn from nature by Mr. Conolly, so well known in this city for his faithful delineations of disease, and whose premature loss the Medical School of Dublin has sadly to deplore.

ST. STEPHEN'S GREEN,  
*December, 1872.*



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A  
TREATISE  
ON  
CHRONIC RHEUMATIC ARTHRITIS,  
OR  
RHEUMATIC GOUT.

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PART I.

THE DISEASE CONSIDERED GENERALLY

---

CHAPTER I.

HISTORY OF THE DISEASE.

THE disease which I am about to describe in the following pages, under the term Chronic Rheumatic Arthritis, or Rheumatic Gout, has been already adverted to by medical writers, who have given to it different names, as it presented itself in different regions of the body. Thus, when the wrists, hands, and feet have been affected by it, the disease has been denominated "Rheumatic Gout;" but when the shoulder, elbow, or knee-joints have been either singly or simultaneously engaged, it has generally been named "Chronic Rheumatism."

It is well known that this same malady sometimes fixes itself in the various structures which enter into the composition of the hip-joint, producing a chronic disease of this articulation which has been termed "morbus coxæ senilis," and under this head the complaint has received a separate consideration from clinical physicians and surgeons.

Above half a century ago a very eminent physician of Bath, Dr. Haygarth, saw the propriety of giving a distinct consideration to this peculiar affection of the joints, and, observing that it did not answer to the description of either 'gout or rheumatism, suggested, as a proper designation for it, the term "*Nodosity of the joints*," deriving his ideas, we may suppose, in thus naming this disease, from the hard swellings he observed around the several smaller joints, particularly of the fingers (see Atlas, Plate VI., Figs. 1, 2). He added, that by thus giving to the disease a distinct name, he trusted that it might be considered as a separate genus, and become a more special object of medical inquiry.

Although Sir Benjamin Brodie,\* Mr. Key,† and Lobstein,‡ as well as Mr. Benjamin Bell, have all since made allusions to this disease, Cruveilhier seems to me to be the next writer|| who has specially called attention to it, and pointed out the propriety of studying, with reference to each other,

\* In his work on the Joints. † Med.-Ch. Trans., vol. xviii.

‡ In his Pathological Anatomy, tom. ii.

|| 1829-35, Anatomie Pathologique.



its symptoms in the living subject and its anatomical characters in the dead.

"This disease," says Cruveilhier, "has been for a long time attended to, so far as relates to its anatomical characters; but it would appear," he adds, "that the time had arrived when it should claim the attention of the *clinical* physician; that its symptoms and treatment should get more consideration; and, in a word, that it should take its place in the nosology of the joints" (or, to adopt the words of this eminent French physician, "prendre rang parmi les maladies des articulations"). This disease, he thought, was the more deserving of attention because he felt persuaded it was habitually confounded with gout, rheumatism, and even white swelling, and often combated by measures and by treatment, the inutility of which he believed to be the least of the evils attending on them. He has denominated the disease "usure des cartilages articulaires," thus, it is true, assigning to it "a local habitation and a name." The term, however, here suggested by Cruveilhier, it is plain, would localize the disease too much, confining it merely to one of the articular textures, whereas we know that, when fully formed, most, if not all, of these textures are found to be implicated; and as to the term "*Nodosity* of the joints," although it is now more than half a century since it has been proposed by Haygarth, it has been very partially, if at all, adopted. Indeed, the swellings of the joints which we notice in this disease are by

no means hard, as the term "nodosity" would imply; on the contrary, as in its early stages the swellings are principally constituted by the effusion of much synovial fluid into the interior of the joint, they are soft and fluctuating. Besides, the term "nodosity" could be properly applied only to those knobby tumefactions of the smaller and more superficial joints, as those of the hands and feet, and to the advanced stages of the disorder; and such a term could not with propriety be made use of, with any idea of thereby correctly designating the condition of the larger joints, such as those of the shoulder and knee, when severely affected by this peculiar disease.

While I agree with Haygarth and Cruveilhier, that it is a matter of much importance to give to this disease some special designation, so that it may get a distinct consideration from the profession and the public, I find, equally with them, the difficulty of proposing any unobjectionable name for it. Its symptoms, like those of "chronic rheumatism," are slow in their progress, and, like rheumatism, subject to atmospheric influence; it is of a sub-inflammatory nature, and the joints, large and small, are the principal seats of it; it is, therefore, a "chronic arthritis," or "chronic inflammation of the joints," partaking more of the rheumatic character than of any other with which I am acquainted. With such ideas, I have long since ventured to name the disease "*Chronic Rheumatic Arthritis*," or "Rheumatic Gout;" and under this head have com-

municated to the "Pathological Society" here many facts and observations on the malady; and, indeed, I may say that the term is now current with the profession.

Many years ago I endeavoured to draw attention to this disease by reading a paper\* before the Medical Section of the British Association, at their meeting at Bristol in September, 1836. I then adduced cases and exhibited specimens illustrative of its anatomical characters in almost every joint in the body. On that occasion I remarked that this disease had attracted much attention for many years previously from the profession in Dublin, particularly so far as the hip-joint was concerned; and that, although nothing had been *printed* on the subject in that city previously to Dr. R. W. Smith's valuable paper in the sixth volume of the "Dublin Medical Journal," yet the clinical lectures delivered by the late Drs. Colles and Wilmot in Stevens' and Jervis-street Hospitals, and subsequently by myself, in the latter institution, February, 1831, were calculated to make known not only the symptoms, but also the anatomical characters, of the "chronic rheumatic arthritis," as it affected the articulations in general, and in particular the hip-joint; I may add that I have subsequently published, in the "Cyclopædia of Anatomy and Physiology," many original observations on this disease,

\* See Athenæum, September 10, 1836: Report of the Proceedings of the British Association.

as it affected the different joints, the abnormal anatomy of which it fell to my lot to describe.

Besides his essay on this disease, as it affects the hip-joint, Professor Smith has from time to time adduced at the meetings of the Pathological Society specimens showing its effects on the articulations of the clavicle, lower jaw, tarsus, shoulder, and spine. Nor should I here omit to refer to the "Notes on the Morbid Anatomy of Chronic Rheumatic Arthritis of the Shoulder and other Joints,"\* by Mr. Edward Canton, of London—nor to the circumstance that two eminent physicians of London, Drs. Fuller and Garrod, have each published a work on Gout, &c., in each of which volumes will be found a special chapter on Rheumatic Gout; and to their observations I shall have frequent occasion to refer in the course of this new edition, particularly in the chapter relative to the medical treatment of this disease.

\* See Medical Gazette, 1848.

## CHAPTER II.

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### CAUSES AND SYMPTOMS OF THE DISEASE.

BEFORE I enter into an inquiry as to what may be considered the ordinary *causes* of this disease, I beg, in the first place, to state that chronic rheumatic arthritis, or rheumatic gout, may be looked upon sometimes as a *constitutional*, and sometimes as a *local* disorder. For example, when we observe it at the same time affecting almost all the joints in the same individual on both sides symmetrically, we may feel assured that the chronic articular affection in such a case has proceeded from some deep constitutional taint. In the majority of such cases we shall, I believe, discover that the general chronic affection has been immediately preceded by an attack of rheumatic fever, from the lingering remains of which the chronic rheumatic arthritis had evidently sprung. Moreover, if we seek for the original cause of the rheumatic fever in many of those cases in which it has thus unhappily merged into a chronic disease, we shall find the attack rationally attributed to the imprudent ex-

posure of the person of the patient to cold and humidity, and to the night air, at a time when he had been much predisposed to illness by having been placed under depressing influences. We can refer to many cases contained in the following pages, exemplifying the truth of these observations.

In other instances we have known the chronic disease we are here considering to originate, without any precursory fever, from the sudden exposure of the person to cold at a time when the body had been much overheated by hard labour. The abrupt suppression of an habitual transpiration from the feet, by the patient having been kept for a long time standing in water up to the knees, I have also known to give rise to the first symptoms of this chronic disease, which has in the end become general over the whole system, and has ultimately implicated most of the articulations, and thus become a severe constitutional malady.

As a purely local disease it has been frequently found to have originated in accident. Haygarth gives the case of an adult man who violently sprained his wrist, and in whom this disease immediately appeared in the structures of the injured articulation, and remained confined to it.

I have seen some instances in which the hip-joint was the seat of this disease as a local affection, in which, from some special causes, it so happened that an inordinate amount of exertion had been for a considerable time thrown on one of the hip-joints, which at length became affected by this

chronic disease. I may also mention that I have known cases in which severe concussions communicated to a large joint, such as that of the shoulder or hip, have, as it appeared to me, been fairly assigned as the determining causes of chronic rheumatic arthritis\* in these articulations. One instance in which this chronic affection of the hip-joint succeeded (after the lapse of a few years) to an accidental luxation of this joint, has also occurred to me. It must, however, be admitted that we meet with many examples of this disease, for the origin of which no rational cause can be assigned, and then it is said to have had a spontaneous origin. In some cases the disease evidently seems to have been hereditary.

#### SYMPTOMS OF THE DISEASE.

I believe I cannot better convey an idea of the symptoms of this disease than by giving a condensed account of the observations of previous writers on this subject, and by comparing their observations with those of the medical men of this city, where the affection has been studied with much care, both as to its symptoms and pathological anatomy.

Haygarth, in his work already referred to, observes that "The term rheumatism has been applied, without sufficient discrimination, to a great variety of disorders, having but few symptoms,

\* See the case of Mr. Mathews, the comedian.

except pain, which connect them together." He adds:—"A case happened to occur to my observation at a very early period, which, compared with others at subsequent times, convinced me that there is one painful and troublesome disease of the joints of a peculiar nature, and clearly distinguishable from all others by *symptoms* manifestly different from the gout, and from both acute and chronic rheumatism."

This peculiar disease he called, as already mentioned, *Nodosity of the Joints*; and, from accurate notes and tables kept by himself, he calculated that in the practice of his profession he encountered it once in every 310 patients.

The swellings of the joints, which he denominated "Nodes," he considered were almost peculiar to women, and observed, "that they generally showed themselves about the period of life when the menses naturally cease." "Out of thirty-four cases," he says, "I find two where the knees only were attacked; in all, or nearly all the rest, the hands, chiefly the fingers, were affected." He adds: "These diseased joints generally suffer pain, especially at night, but in a less degree than might be expected from such a considerable morbid change; they feel sore to the touch; in one case the patient was attacked with severe spasmodic pains; as the disease increases, the joint becomes distorted, and *probably* in bad, inveterate cases, *even* dislocated, and its motions become gradually more impaired. In a few patients a *crackling*



“*noise* was perceived in the joints when in motion, particularly in the neck; the skin seldom or never appears inflamed; the nodes appear most nearly to resemble gout.”

Out of the number of cases above stated, he adds, there was only one man: he appeared to be about fifty or sixty years of age. He ascribed the complaint to a fall, which violently strained his wrists and fingers, which were the only seat of the “nodes” in this case. But in the female constitution it is seldom confined to so few joints. He further says: “This disease does not affect the muscles.”

Cruveilhier, in speaking of the symptoms of this disease, truly observes, “that the victims of it suffer and complain of a singular *rigidity* in the affected joints; they feel and hear a kind of *crackling* in the exercise of their joints, and these movements are always accompanied with pain. The *crackling* sensations felt in the joints, and this rigidity of the limbs, followed by pains, are very considerable at the moment the patient commences to move about, particularly in the morning, after the repose of the night.” Besides these symptoms above enumerated as frequently attending on cases of Rheumatic Gout, we should not omit here to observe that, instead of *rigidity* of the articulation, we have in some severe and special cases of this disease found, on the contrary, that an *abnormal mobility of the joints* existed, rendering them nearly useless to the patient, particularly if any of the

joints thus affected constituted part of the lower extremity, as, for example, the knee (case of Stafford, *see* Index), &c., &c.

Haygarth's observation, that this disease does not affect the muscles, requires explanation. We are, I think, to infer from it that the muscles are not organically affected, as are the joints and surrounding structures. Any one who has seen much of the malady must have noticed that, when it is general in the constitution, there is no one symptom more complained of by the patient than the painful *spasms* and cramps of the muscles; indeed, Haygarth has himself said that in one case the patient was attacked with severe spasmodic pains.

The last-named author observes, "that the joints under the influence of this disease gradually increase, and become harder." This latter observation, as to hardness, must apply to the joints of the fingers or toes, or to the latter stages only of the disease in other articulations, because, as I have already mentioned, in the early stages of this affection the principal enlargement of the joints arises from the effusion of a large quantity of fluid into the synovial sac. Hence the swellings we observe are soft, and afford evidence to the touch of fluctuation in them.

We might infer from the observation of some, that this chronic disease affects elderly persons only, and many are so prepossessed with this idea, that they would class it among the *senile* diseases; but this is an error. I have seen it in numerous

patients under the age of twenty, as a general or constitutional disease, affecting many of the joints simultaneously.

Haygarth considered the disease common among females, but so rare in the male, that (although we know he had been studying it for twenty-six years) he states he had noticed the case of only one man affected by it.

Upon this question, as to what is the comparative frequency of the affection, how it so happened to this eminent physician to have met with so few specimens in the male, I cannot take upon me to say; but, if I were myself asked, "What is the comparative frequency of the affection in the two sexes?" I would reply that I have observed that men seem to me to be on the whole as subject to chronic rheumatic arthritis as women; but that, if we make the comparison in different joints, we shall find men more affected with this disease in the hip-joint than women; and that the wrists and hands are much more frequently engaged in the female patient.

Haygarth and Cruveilhier, as I have already mentioned, both allude to a remarkable symptom of this disease which some writers have overlooked, and others but slightly mention, namely, that the movements of the articulations affected with it are generally accompanied with a *crackling noise*; the former writer says:—"In a few patients a crackling noise was perceived in the joint when in motion, particularly in the neck." I have noticed this phenomenon

very generally in almost all the joints affected by this disease. In a case which I have elsewhere\* given of it, affecting the knee, I have alluded to it in the following words:—"When we grasp and flex the leg or the thigh, at the knee-joint, we find we can elicit a peculiar articular crepitus;" in the case in question it was quite audible, and resembled much the noises which accompany the discharge of electrical sparks, when emitted in quick succession from an electrical apparatus. This symptom of crackling produced on the movement of joints affected with this peculiar disease, I have never known to be more remarkably illustrated than by the case of the late Dr. Perceval, who was for many years afflicted with this malady in both his hip-joints. He often called the attention of his attending physician to the succession of loud crackling sounds, to be heard by every one present in the room whenever he arose slowly from his chair. These sounds, he felt himself, were distinctly referrible to the motions on each other of the altered articular surfaces of the hip-joint.

Haygarth seemed to think that the disease attacks persons in the higher and middle, rather than in the lowest, ranks of life. Sir B. Brodie observes, "that in his experience it will be found most in those who have led luxurious lives, and have not been accustomed to much bodily exercise," and is of opinion that too great indulgence in animal food is more

\* Cyclopædia of Anatomy, Art. Knee-joint.

likely to produce it than the free use of fermented liquors.

Although we witnessed this disease in persons of all ages and ranks, our experience in this city makes us rather concur with Dr. Robert Todd than with the foregoing writers. He says :\*—"It is to be observed more among the labouring poor than among the higher classes." We also believe, with him, that the disease is more common in Ireland than in England. I may observe, however, that I have found more numerous anatomical specimens exhibiting the post-mortem results of it in the museums of Holland than I have seen elsewhere, if I except those which are to be found in the pathological collections in Dublin.

The description Sir Benjamin Brodie has given of this disease, in the last edition of his work (1850) on the joints, seems to have been taken from the observations he has made on it as it appears in the wealthier classes of society, in whom, as he has seen it, it presents more of the gouty than of the rheumatic character. "The patient," he says, "who is afflicted with this disease," which he denominates 'rheumatic gout,' "in addition to his local ailments, always suffers, in a greater or less degree, from the usual effects of dyspepsia, which are aggravated by want of exercise; he is liable to acidity of the stomach and flatulence after his meals, is nervous and irritable; and every error

\* Todd on Gout and Rheumatism.

as to diet, as well as all mental excitement, will produce an aggravation of both the constitutional and local symptoms."

In his experience he has found that in a few instances the disease, after having reached a certain point, becomes stationary, or there may be, apparently, some degree of improvement; but, except when it was treated in the very earliest stage, he does not recollect any one case in which there was anything approaching to a cure. In the majority of cases this disease is progressive, the joints being more and more disorganized, sometimes with little, at other times with much, increase in size, and the increase depends not only on the cause before adverted to, but also on a deposit of new bone in the neighbourhood of the affected joint, and sometimes on that of a gouty concretion in the surrounding cellular tissue. "*Anchylosis*," he adds, "sometimes takes place as an ultimate result, but there is little tendency to suppuration."

I readily agree with Sir Benjamin Brodie that the enlargement in the affected joints, which we notice in the earlier stages of this disease, arises principally from the increased effusion of fluid into the synovial sac of the articulation, the result of the chronic synovitis, which at this period exists. In the latter stages of the affection, exostotic growths can occasionally be felt through the integuments to spring from the margins of the articular surfaces, as well as from the periosteum and bone in the neighbourhood of the diseased joint.

As to the knee, rims of new bones can be felt to range themselves along the margins of the condyles of the femur and tibia. (See Atlas, Plate VIII., Fig. 2, *c, c.*) In the vicinity of the hip-joint the great trochanter and the horizontal ramus of the pubis may be found enlarged.

The synovial bursæ in the neighbourhood of the affected joint are occasionally found distended, and add to the apparent bulk of the articulation; some of these bursæ are merely offsets\* from the larger synovial sac of the joint; some are completely isolated, having no communication whatever with the cavity of the articulation.

It is no uncommon circumstance to observe, when the elbow-joint is the seat of this disease, that the bursa of the olecranon process shall become enlarged, and contain small "foreign bodies" in its interior. It is true, also, that synovial cysts become, as it were, accidentally developed in the cellular tissue surrounding the affected articulation, having, as already mentioned, no communication whatever with the diseased joint. As the disease advances, the fluid contained in these cysts may become absorbed, and the bursa be converted into a small solid tumour; but we have *never* met with the *gouty* concretions mentioned by Sir Benjamin Brodie, nor have we found in our post-mortem examinations any white chalky layers of lithate of soda deposited on the articular surfaces in any case

\* See Plate IX., Fig. 8, A.

which we considered to have belonged to the class we have called cases of chronic rheumatic arthritis. There is another point I wish to advert to, in which we find that our experience in this disease does not correspond with that of Sir Benjamin Brodie. In his observations "on chronic disease of the joints connected with gout and rheumatic gout," he speaks of *anchylosis* as being an ultimate result of this disease, which may be expected. That he does not by this observation intend to allude merely to the articular rigidity which belongs to this disease is plain, for he evidently seems to contrast this state of rigidity and anchylosis; for he says, "some are *completely anchylosed*, and others are so stiff as to be nearly useless."

I would not be understood to deny that true bony anchylosis is occasionally to be seen as the result of chronic rheumatic arthritis. Indeed, I shall hereafter have occasion to refer to the dissection of one case of this disease in which this process had taken place among some of the *bones of the carpus*; but as, after many years' investigations and many dissections, this has been the only specimen of "true bony anchylosis" I have met with, I think I may conclude that true bony anchylosis, as an ultimate result of this chronic rheumatic disease, must be considered to be *very rare*. Indeed, if we carefully examine the notes of the only case adduced by Sir Benjamin Brodie in support of his opinion as to anchylosis, we find that from external examination



only he inferred that the joint of the right elbow, together with several joints of the fingers and toes, were ankylosed; but the only *proof* of complete bony ankylosis having taken place in any of the joints, ascertained by dissection, is contained in the following words, in the report of the post-mortem examination in this case:—"In the right wrist the carpal bones of the first row were ankylosed to each other, and to the radius." And here let me advert to an interesting example of the disease I have called chronic rheumatic arthritis, given by Cruveilhier, which may show how a good observer might easily fall into the error of imagining that complete bony ankylosis existed in many joints, had he relied on external examination alone.

"La plupart des articulations étaient le siège d'alterations plus ou moins considérables, et notamment les articulations scapulo-humérales, les genoux, les coudes, qui *semblaient ankylosés*, en sorte, que cette malheureuse était condamnée à garder le lit dans un état d'immobilité presque complet et à recourir à l'autri pour subvenir à ses besoins naturels. La malade attribuait sa maladie à un rhumatisme goutteux dont elle aurait été tourmentée dès sa jeunesse. Cette malade s'étant morte, je trouvais toutes les articulations dépourvues de cartilages avec déformation plus ou moins considérable des surfaces articulaires. *Il n'y avait pas d'ankylose*; mais les os étaient maintenus dans l'immobilité par suite de cette déformation

des surfaces articulaires et par la rétraction des ligamens."\*

For my part, I have met with many examples of this disease, in which the stiffness and immobility of the joints were found to have arisen merely from the alteration in form the articular surfaces had undergone. I have seen, for example, the orbicular head of the femur converted into an oval form, forbidding any other motion than that of a very slight flexion on the pelvis; I have found the head of the radius at the elbow-joint to have assumed, instead of a circular, an oval,† and occasionally even a quadrilateral form as to its outline, preventing altogether the normal movements of pronation and supination; yet in no instance have I known the hip, knee, or elbow to exhibit any example of *true bony ankylosis*, nor have I discovered any specimen of solid union of the bones, except in one dissection and maceration of the bones of the carpal region.

Upon the whole, then, it would appear, that articular *rigidity*, or false ankylosis, is not an unusual consequence of this disease, but that true bony ankylosis, in which it is to be understood that there is complete fusion together of the two bones, which then form, in reality, but one, is, as the result of this chronic rheumatic arthritis, exceedingly rare.

\* Anatomie Pathologique, par J. Cruveilhier. Paris: Livraison xxxiv. p. 1.

† See Atlas, Plate iv., Figs. 1, 2.

I may add that, for the many years I have been communicating observations to the Profession on this affection, I have always taken pains to point out this remarkable character of chronic rheumatic arthritis, viz., that the inflammation of the structures of the joint in which the disease consists rarely goes on to suppuration—I say rarely, because I do not mean to assert that instances do not occasionally present themselves in which an attack of acute arthritis may be seen to have supervened on chronic rheumatic arthritis, and that in such cases inflammation may proceed to the formation of purulent matter in the cavity of the articulation—indeed, I have known two fatal cases of this description, which I shall hereafter refer to. All I would be understood to assert is, that a case of chronic rheumatic arthritis does not, in its ordinary course, proceed to suppuration, as other inflammatory and sub-inflammatory affections of the different articular textures frequently do.

## CHAPTER III.

### DIAGNOSIS AND PROGNOSIS.

As to the *diagnosis* of this disease, Haygarth,\* the earliest writer on the subject, thus expresses himself :—“ The nodes appear most nearly to resemble  
“ gout ; both of them are attended with pain and  
“ swelling of the joints, but they differ essentially  
“ in many distinguishable circumstances. In the  
“ gout the skin and other integuments are gene-  
“ rally inflamed, with pain, which is often acute,  
“ soreness to the touch, redness and swelling of the  
“ soft parts, but in no respect like the hardness of  
“ bone. The gout attacks the patient in paroxysms  
“ of a few days, weeks, or months, and has com-  
“ plete intermissions, at first for years, but after-  
“ wards for shorter periods. The gout attacks men  
“ much more frequently than women.

“ There is one distressful circumstance which  
“ distinguishes this disease : it has no intermission,  
“ and but slight remissions, for, during the remain-

\* Clinical History of the Nodosity of the Joints, by John Haygarth, M. D. Bath, 1805. Page 150.

“der of the patient's life, the nodes gradually enlarge, impeding more and more the motion of the limb; the malady spreads to other joints, without leaving or producing any alleviation in those which had been previously attacked.”

Dr. Garrod agrees as to the correctness of the diagnosis between gout and rheumatic gout, as laid down by Haygarth; yet he observes that many additional points of difference between these two diseases may be mentioned. Thus, as regards the seat of the affection at its first invasion, gout attacking the ball of the great toe, the other disease any joint indiscriminately—the one leading to the formation of chalk stones, the other never doing so: the character of the blood in the two affections is likewise widely different. Uric acid has been found by Dr. Garrod, in every case in which he has sought for it, in the gouty, but he has never found it in those affected with rheumatic gout. When we are considering this last-mentioned disease, as it presents itself in each articulation in particular, we shall have occasion to dwell on the several diseases which rheumatic gout may be mistaken for, and the means of diagnosis shall be pointed out.

#### PROGNOSIS.

Dr. Haygarth, as to the prognosis to be formed of this disease, says:—

“These nodes, in their gradual progress, sadly embitter the comforts of life, but I know no in-

“ stance in which they seemed to shorten its duration. The first patient whom I saw in the disease lived to attain the age of ninety-three years !”

When the disease assumes a local form, and engages only one articulation—as, for example, the hip—the patient, though affected by a lameness, which every year gradually somewhat increases, as his general health is unaffected, may find out many occupations, to the exercise of which his local disease offers but little impediment. Quite the reverse is, however, the case when the disease has appeared as a general constitutional affection, and when many of the articulations of the same individual are simultaneously implicated. The patient's rest at night is then usually disturbed ; he is affected by every change in the atmosphere ; all the movements of his joints are painful to him. The prognosis in such a case is very unfavourable : something in the way of palliative, but little in that of remedial or curative treatment, is to be relied on.

Those of the lower order who are thus afflicted with this as a general constitutional disease soon become incapable of earning their bread, and most of such in this country are consequently at last found inmates of our poor-houses. In these asylums they usually spend much of their time during the winter months in their beds, and even here complain much of the cold. From want of exercise, the circulation of blood through their heart and lungs, and through their limbs, becomes

languid ; the joints become rigid as well as painful ; the surrounding muscles, through disuse, fall into a state of atrophy. The bones and the cartilages also degenerate ; and in some cases, from constant immobility of the joints for years, we have found the articular surfaces to have in points coalesced with each other, and in these points of contact a species of red vascular union of the surfaces to have taken place (see case of M'Garry). When all the joints of the lower extremities are the seat of the disease, the patient frequently becomes altogether bedridden, and the knee-joints and those of the feet become distorted, and even dislocated. The former joints are habitually kept semiflexed, the leg becomes rotated outwards, and under these circumstances we have known partial luxations of the patella occur. The patient usually becomes much stooped in his figure, the spinal column being flexed forward. The neck often becomes rigid ; and this state of things, too, is sometimes found associated with a rigid condition of all the joints, great and small, of the upper extremities. Now, the patient, although he has laid before him food convenient for him, soon becomes really incapable of feeding himself, and thus in a certain sense becomes wholly dependent on others. I have, no doubt, observed many unhappy victims of this disease the inmates of poor-houses, who, had they been placed in more favourable circumstances as to fuel, clothing, and fresh air, might have lived for years with this malady, carried off unexpectedly

during the winter months by sudden attacks of other diseases, such as dysentery or diarrhœa, produced by cold. Some have died of acute inflammations of some of the viscera ; others of chronic phthisis.

Those who are placed in better circumstances, who can provide themselves with the comforts and conveniences of life, who can live in whatever climate they find to suit their complaint best, who can clothe themselves warmly, and who, although unable to walk, can be daily furnished with the means of taking exercise in the open air—those, so far as my observation goes, seem to live as long as any of the same period of life who are free from the disease.



## CHAPTER IV.

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### ANATOMICAL CHARACTERS OF THE DISEASE.

IT will be admitted that the anatomical characters of this disease have not until lately attracted the notice legitimately due to a subject of so much importance: for example, Haygarth, who has so well described its symptoms under the denomination of nodosity of the joints, does not seem ever to have made even one post-mortem examination with a view to ascertain the morbid changes induced by it in the various structures of the articulations. His observations, or conjectures rather, with respect to these changes, are comprised in the following words:—

“In this disease the ends of the bones, the periosteum, capsules, the ligaments which form the joints, gradually increase; these nodes are not separate tumours, but feel as if these were an enlargement of the bones themselves. This point might be ascertained without any difficulty or doubt.”

Sir Benjamin Brodie,\* in more modern times, seems to lament the absence of information relative

\* Sir B. Brodie on Diseases of the Joints, p. 237.

to the anatomy of rheumatic gout, observing that opportunities for examining the pathological condition of the joints, in this disease, are of only occasional occurrence; so that, if we except the few but precise observations of Brodie and Cruveilhier, those of Professor Smith, and the communications of Mr. Canton, as well as those which I have myself made—if, I say, we except these, little has been hitherto done to make the profession practically acquainted with the anatomical characters of this disease.

I shall now proceed to describe in a general way the alterations I have found induced by this disease in the different tissues comprising or connected with the articulations—such as the tendons, lateral and capsular ligaments, cartilages, fibro-cartilages, synovial membranes, and bones.

#### TENDONS.

The tendons which pass over the articular heads of the bones, as well as those which in the normal state identify themselves by their terminal fibres with the capsules—these demand the attention of the anatomist who studies the changes induced by chronic rheumatic arthritis in these structures. Let us take, for example, the shoulder-joint of a patient who had been affected with this disease: the long tendon of the biceps, instead of passing over the articular head of the humerus, as in its normal condition, will be found to be either dislocated internally, it may be in a commencing state of dis-

integration, or, as to its intra-articular portion, it may have disappeared altogether. Again, under the same morbid influence, in this case the terminal tendons of the capsular muscles of the shoulder-joint may be found detached from the tubercles of the humerus.

In a summary abstract which I made of seven cases which were decidedly specimens of chronic rheumatic arthritis of the shoulder, I find in the first edition of this treatise a sufficient statement of the condition of the tendinous structures of the shoulder-joint, couched in the following terms:—

“As to the state of the tendons in these seven specimens, we find that those of the capsular muscles were detached from the tubercles of the humerus: in all the specimens the long tendons of the biceps were found to have been in an abnormal condition; five of these tendons had the appearance of having been ruptured. As to their intra-articular portion, they were either totally or partially absorbed; and their extra-articular portion was adherent outside to the edges of the bicipital groove. In one subject the long tendon of the biceps on each side was symmetrically dislocated internally to the head of the humerus; one of these tendons presented an unravelled appearance.” We may also add, that when a joint, such as that of the hand or foot, has become distorted by this disease, the extensor and flexor tendons are occasionally displaced from their original direction; thus the joint which forms the ball of the great toe is frequently

much deformed by this disease, and in such cases the tendons are thrown much out of their normal directions.

In the notes of the dissection of a foot, in the case of Mailly, which was one of chronic rheumatic arthritis of long standing, we find it is stated that "the superficial and deep tendons of the flexor communis lay internal to the phalanges of the toes, having slipped from the grooves in which in the normal state they are retained;" and in reading more in detail the whole of this case (see Index), it will be seen that in the same subject the long tendons of the biceps had been dislocated internally on both sides from off the round head of the humerus.

#### THE LATERAL LIGAMENTS, AND FIBRO-SYNOVIAL CAPSULES.

The lateral ligaments of the ginglymoid joints must be abnormally elongated, as well as the fibro-synovial capsules, from over-distention of these last, from the effect of effusion into the synovial sac, resulting from the chronic synovitis which had previously existed. These structures will be found to be somewhat slow to recover from the effect of the over-distention they have been subjected to; and therefore we need not be surprised to find a degree of abnormal mobility in a joint which had been the seat of chronic rheumatic arthritis, presenting occasionally specimens of subluxation of the bones, and that in some cases even complete dislocation may be observed.

If we have an opportunity of making a post-mortem examination of an individual who, at the time of his death from some other disease, had been affected by chronic rheumatic arthritis, in this case the fibro-synovial capsules of the affected joints will be seen to present evidence of having been the seat of organic alteration of a chronic nature; the fibro-synovial capsules will be found to be thickened, and at the same time distended, with a preternatural quantity of synovial fluid. This observation will be verified if, for example, we thus are afforded an opportunity of examining anatomically a knee or a shoulder-joint in the early stage of this disease. At this period a state of the articulation, formerly called *hydrops articuli*, will be seen to exist (see Atlas, Plate IX., Fig. 1). The synovial membrane will be found to be thickened, and internally to present a red colour; vascular tufts, red and hypertrophied synovial fimbriæ, will be seen in the joint. (Plate XI., Fig. 2, B.)

In the more advanced stages the redundant quantity of fluid will be found to have been removed by absorption; and the capsular membranes of the joints to have acquired preternatural density. Thus we have seen the capsular ligament of the hip-joint to be nearly a quarter of an inch in thickness; and, as to structure, to present almost a resemblance to intervertebral substance; and, we may add, examples have not been wanting in which portions of bone have been found contained in the substance of the fibro-synovial capsules of the joints.

When the capsular membranes have been cut through, and the interior of the joints which have been long affected exposed, we may very generally observe that some of the normal structures have been altogether removed; *in the hip-joint not a vestige of the round ligament will be seen; nor of the long tendon of the biceps, or glenoid ligament in the shoulder-joint*; and all the articulations, great or small, which have been long affected are usually divested of their cartilages of incrustation.

*The interarticular fibro-cartilages*, too, are also, with very few exceptions, absorbed when the disease has existed long in any joint normally possessing these structures. I have proved the truth of this observation by my examinations of the articulation of the lower jaw, and of the sterno-clavicular joints, as well as, also, by my inquiries into the condition of the wrist-joint. Not a vestige of the interarticular fibro-cartilage will be found in the post-mortem examination of these joints, if they had been *long* and severely affected by the disease, or if it be of the constitutional form.

The same observation applies also to the knee-joint; in every well-marked case of this disease which I have examined anatomically (with two or three singular exceptions), the semilunar cartilages have been absorbed as completely as the cartilages of incrustation of the heads of the bones. In two of the exceptions referred to, the cartilages were hypertrophied (Atlas, Plate VIII., Fig. 3). In another case (M'Garry) the semilunar cartilages were

partly ossified. The fibrous brim which, in the normal state, surrounds the glenoid cavity of the scapula, as well as that which completes the cup of the acetabulum of the hip-joint, are altogether removed under the influence of the morbid processes induced by this peculiar disease.

#### FOREIGN BODIES.

The description of chronic rheumatic arthritis would be very incomplete, whether we allude to the symptoms of this peculiar affection or to its anatomical characters, were we to omit noticing, more fully than we have yet done, those "*foreign bodies*" which are generally to be found in the joints of patients who have suffered for a long time and severely under this disease. I do not pretend to assert that articular "*foreign bodies*," as these are called, are not occasionally to be found in the interior of the joints of patients who present no symptoms of the chronic disease I am describing; but, on the other hand, I feel persuaded that some of the published cases of foreign bodies removed from the interior of the articulation of the knee by surgical operation were cases in which these foreign bodies constituted but one *symptom* or part only of the disease I have named chronic rheumatic arthritis. That these foreign bodies frequently exist in the joints of individuals who have long suffered from this disease is amply proved by our observations on the living and on the dead; and, in illustration of this important practical point, I shall here-

after take occasion to refer to numerous specimens extant in various museums, in which preparations the simultaneous coexistence in the same joints of these foreign bodies with the eburnation of the articular surfaces, bony vegetations, &c., may be observed, and from all which we may feel convinced that these foreign bodies must be looked upon as belonging to the ordinary signs of this chronic rheumatic disease.

In some cases they exist in very considerable numbers. Haller found twenty small cartilaginous bodies in the synovial sac of the lower jaw; Morgagni twenty-five in the left knee-joint of an old woman; and I have delineated the preparation of an elbow-joint in the Museum of the Richmond Hospital, in which the synovial sac contained no fewer than forty-five foreign bodies. (Atlas, Plate v.). Some are small, and others of very considerable magnitude. I shall elsewhere in these pages refer to several cases in which the knee-joint had been the seat of these foreign bodies, of a very large size—for example, an inch and a half or two inches in diameter.

In all the above-mentioned instances of foreign bodies found in the various joints, in the cases of Haller and Morgagni included, these foreign bodies are in my opinion to be looked upon as the products merely of chronic rheumatic arthritis.

The consistency of these foreign bodies is various; sometimes they have the appearance of cartilage throughout their substance; at other times we find them bony in their centre, and cartilaginous in



their circumference. In certain cases they will be found to possess a softer cellular nucleus, enveloped by a cartilaginous crust or covering; on the other hand, they have been seen to be bony throughout. Occasionally they are made up of many little bony lobules united by means of very short ligamentous fibres. In almost all cases it is probable that they are enveloped by synovial membrane, to which they owe their smooth and polished surface.

When we come to inquire into the mode of development of the foreign bodies, we must, in the first place, recollect that the synovial membrane of the joints is, no doubt, the structure in which is laid the foundation of the chronic, as it is of the acute rheumatic arthritis. In the substance of this membrane, now in a morbid condition, or in the cellular structure immediately subjacent to it, is deposited the particle of lymph, which, soon becoming organized, forms a small tumour, which projects slightly in the interior of the synovial sac of the joint—and this I believe to be the first step towards the further development of the foreign bodies found in the interior of almost all the synovial sacs. At first the small tumour has its basis broad, and seems immediately connected with the subjacent part. By degrees it advances into the interior of the synovial cavity; and thus its basis, at first comparatively broad, becomes narrowed into a neck, which gradually elongates, and becomes more and more attenuated, so as to form a lengthened pedicle or funis, connecting the little body to some of the va-

rious structures in the interior of the joint. Thus the foreign body may be connected by means of a slender ligament to bone; sometimes to the interior of the capsular membrane; sometimes to cartilage or to fibro-cartilage, &c. (Plate VIII., Fig. 3). This slender connecting ligament permits a certain extent of motion to the foreign body; so that, without losing its attachment, it may appear within certain limits in different parts of the cavity. Lastly, when many of these foreign bodies exist simultaneously in any one joint, they have been found adherent one to another (Plate v.), and also to the interior of the capsular membrane, by means of similar long ligamentous filaments. In one case I have seen in the shoulder-joint the foreign body nearly two inches long, and of a crescentic figure, which seemed to embrace the anatomical neck of the humerus with its two cornua, and the latter adhered by their extreme points to the synovial membrane, investing this portion of the neck of the humerus within the joint. (See Plate II., Letter *g*.) Also, but rarely, these foreign bodies have been found free in the interior of the articulation: once I have seen one embedded in a receptacle formed for it in the back part of the condyle of the femur. (Museum of the College of Surgeons, London.)

Some writers, with Monro, are of opinion, that bony foreign bodies found in the interior of the joints occasionally owe their origin to the accidental detachment of a piece of bone from the articular

surfaces: thus, Sir Benjamin Brodie says: "In one case in which I had an opportunity of examining the parts by dissection, besides some loose cartilages having the usual appearance, I found another loose body of an irregular shape, with one surface smooth and cartilaginous, and the other surface having a thin layer of bone adhering to it, being evidently a portion of the articular surface actually broken off from the head of the tibia. That such an accident should occasionally happen from any sudden or violent motion of the joint, with a hard body loose in its cavity, is no more than might reasonably be expected."

On the other hand, we must, I imagine, look upon such cases as exceptions, as Sir B. Brodie would appear to do, because we find these "foreign bodies" under many circumstances in which they could by no possibility have owed their origin to any accidental detachment of a fragment of either cartilage or bone. I have seen these rounded bodies, for example, attached by short pedicles to the thin edge formed by the concavity of a semilunar cartilage, to the fibres of the anterior crucial ligament—nay, more, I shall also have occasion to refer to one case, in which numerous foreign bodies existed in the interior of the synovial sac of the knee-joint; and close to, but *outside\** of, the syno-

\* Museum of the College of Surgeons of England, 954. Vol. II., p. 236, of the Catalogue. This specimen presents all the anatomical characters of chronic rheumatic arthritis. It was presented by Sir Wm. Lawrence.

vial membrane, in the popliteal region, were also to be seen rounded foreign bodies, exactly similar in their nature to those attached to the inside of the synovial sac.

Besides this first species of foreign—also called “pendulous bodies”—so well known to the profession since the time of Ambrose Paré—either formed of cartilage and of bone, and free, or connected by means of a slender filament to the interior of the joint, there are other species of productions to be found within the joints which require some observations from me, while I am considering the anatomical characters of chronic rheumatic arthritis. Foreign bodies of this second species, which I have ventured to name “*additamentary bones*,” are usually to be found deepening and enlarging the cavities of reception for the heads and condyles of bones composing the articulations. I have noticed these productions only in joints which have been long and severely affected by this peculiar disease. When the brim of the acetabulum of the hip-joint is rendered—as it very frequently is by this disease—preternaturally deep, the increased depth is sometimes owing to the addition of pieces of bone which appear to me to be newly formed (Plate VII., Fig. 3, *b, b*). These osseous productions also seem, in some rare cases, to render the glenoid cavity of the scapula larger and deeper, thus, as it were, better to accommodate the head of the humerus, which usually becomes enlarged under the influence of this disease. There is a remarkable preparation of

a shoulder-joint in the Museum of the College of Surgeons in this city, which will exemplify the ultimate effects of this chronic disease on the bones of the shoulder-joint. The head of the humerus is greatly enlarged; the surface of the glenoid cavity is covered with porcelain-like enamel, and its posterior margin is much deepened and widened by the addition of several pieces of bone, evidently of new formation. These, six in number, are of a somewhat pyramidal form, each being fully as large as one of the carpal bones (Atlas, Plate IX., Fig. 7). In this case these additamentary bones seem to have been, as it were, designed by nature to enlarge and deepen the glenoid cavity of the scapula, and to make it better suited to accommodate the enlarged head of the humerus.

The late Dr. O'Beirne and I had, from time to time, under our care in the Richmond Hospital, a patient (Lynch) who had chronic rheumatic arthritis in both knee-joints. He was ultimately removed to the North Union Poorhouse, where he died of chronic disease of the bladder; and on a post-mortem examination having been made of the affected joints, besides numerous foreign bodies of the description first adverted to (Atlas, Plate VIII., Fig. 3, B), there were to be seen six or seven additamentary bones, which seemed to supply the place of a portion of the inner condyle of the tibia, which, under the mysterious influence of this peculiar disease, had disappeared without suppuration having occurred.

The bony additions which we occasionally find made to the articular surfaces and processes of the elbow-joint, when it has long suffered from the effects of this disease, come under the same denomination (Plate IV., Fig. 4, A, G).

Some might be inclined to suppose that, in some of the specimens I have adverted to, the appearances of the joints might be accounted for by referring them to the accidental detachment of fragments from the edges of the articular surfaces, and suspicions might well arise in the mind that such really was the case, so far as some of the examples I have adduced may be concerned; but, in my opinion, no doubt whatever can exist as to the shoulder-joint already alluded to, and represented (Plate IX.). The numerous irregularly-shaped bones which, in this specimen, deepened the glenoid cavity, could never have been supplied by fragments (properly so called) detached from the edges of the original articular surface.

These pieces of bone which have been found in the articulations, when affected by this disease, must, in my mind, be considered as new products, and as the result of the ossification of the structures in the immediate vicinity of the joint, and it is reasonable to suppose that they owe their existence to the irritation produced by the disease we are here endeavouring to describe.

Lastly, under the influence of the morbid process which goes on in the interior of the joints under the name of chronic rheumatic arthritis, mem-

branous productions, or "vascular excrescences," are to be found in almost all the articulations affected by this chronic disease. They are usually found in the recent state, highly red and vascular. Anatomists have noticed that in almost all the joints vascular synovial fimbriæ exist at the margins of the cartilaginous surface. They are to be seen in the normal state of the joint, surrounding the neck of the femur and humerus, as well as elsewhere. These fimbriæ, under the influence of the disease, become hypertrophied, and present very remarkable appearances, which have not been much noticed by pathological anatomists. Those enlarged fimbriæ, or "vascular excrescences," from the interior of the synovial sacs of the joints, seem specially to exist in cases in which the disease called chronic rheumatic arthritis had commenced in a joint, and they are to be found in a comparatively early period of the affection. Cruveilhier observed them in the knee-joint of an individual who had also other signs, in the same knee-joint, of the disease we are endeavouring to describe in this work.\*

On two occasions, at meetings of the Pathological Society in Dublin, during the sessions 1839-40, I called the attention of the Society to the recent post-mortem appearances presented by the structures of the hip-joint, in rather an early stage of chronic rheumatic arthritis. In these examples,

\* See *Liv. ix. Plate vi.*

on opening the thickened capsular ligament, the shortened neck of the thigh bone was beset inferiorly by a countless number of highly red, villous-looking productions of the synovial membrane. These were of a rounded, conical form, about half an inch long, and two or three lines in thickness at their bases (see Atlas, Plate XL, Figs. 1, 2).

Similar productions from the synovial membrane are to be seen on making the post-mortem examination of the shoulder and other joints of individuals who had been affected with the chronic disease we are here considering, as we shall hereafter have occasion to show.

ALTERATIONS FROM THE NORMAL STATE PRODUCED  
BY THIS DISEASE IN THE OSSEOUS SYSTEM.

The cartilaginous incrustations which invest the articular extremities of the bones are, under the influence of this chronic disease, altogether removed; and when the disease has been of long standing, the place of the cartilage thus removed is usually supplied by an ivory-like enamel, remarkable for its fine polish and hardness. In the first class joints, such as those of the hip and shoulder, the surface of the head of the femur or humerus becomes, in whole or part, as smooth as an ivory billiard ball. In the ginglymoid joints, such as the knee and elbow, the place of the removed cartilage is supplied by means of patches of ivory or porcelain-like enamel, marked by parallel grooves hollowed out in the direction of the movements of the



joints. These grooves are usually seen on the condyles and trochlea of the femur, and on the posterior or articular aspect of the patella (Atlas, Plate VIII.).

As soon as the cartilages have been removed, under the influence of the peculiar morbid processes which are set up by this disease, the denuded bony surfaces, not having been organized to bear the effects of friction and attrition, are partially worn away, and a smooth enamel is formed by the mutual action of the bones on each other. Around the articular surfaces, thus mechanically acted upon, bony vegetations arise. The heads of the bones, thus enlarged, and sometimes flattened, get the appearance as if they had been crushed down. The necks of the humerus and femur become gradually shorter, from a species of interstitial absorption they undergo, and, under such circumstances, we can easily imagine that any one not familiar with these anatomical characters of this peculiar disease might be led to infer, on meeting with them, that he had before him specimens of fractures of the anatomical neck of the humerus, or even of an intra-capsular fracture of the cervix of the femur which had been united by bone. That such mistakes have often been made in these countries, we have unfortunately too many cases to prove; and we may cite the authority of Cruveilhier to show, that elsewhere also these appearances have been misunderstood.

As the heads of the bones are greatly enlarged by this disease, the cavities for their reception are

found to be proportionably expanded. In many cases these sockets are rendered much deeper than natural, and in others they are found shallower and otherwise deformed, as will be more particularly adverted to when each articulation shall be specially considered as affected by this disease.

As this chronic disorder, if it be general in the system of the joints, imposes on the sufferer the necessity of being almost constantly confined to the house, or even to his bed, we might expect, on making a post-mortem examination of the osseous system of such patients, that we should find it in a condition approaching to atrophy ; and that this is, in reality, frequently the case is not to be denied ; but, on the other hand, when in our anatomical investigations we notice the articular surfaces to have been much worn by this disease, we find that the shafts of the bones are variously affected.

In some instances these preserve their normal condition ; in others they are greatly enlarged in different parts, and have become, consequently, heavier than natural. This increase of weight, however, does not arise merely from the external enlargement of the bone ; but, when the interior of the osseous structure has been exposed by a section having been made through it with a saw, the bones are, by this means, shown to have attained great hardness and density, as many examples, hereafter to be referred to, will verify. In one instance (*Mary Keefe*) the lower jaw had its right ramus one inch longer than the left, and the condyle on this side

was three times larger than natural (Plate 1.). In another case of this disease, the ulna and olecranon process had attained a gigantic size (Atlas, Plate IV., Fig. 4).

All these cases show that although in this disease the articular surface may suffer from the effects of weight, pressure, and friction, the parts of the bone in the immediate vicinity of the articular surfaces occasionally exhibit the effects of a preternatural growth of bone, and that even the irritation in which this disease consists, whatever it be, does not confine itself merely to the wearing away of the cartilage or the enlargement of the articular *heads* of the bones; but that, in some cases, the *shafts* and centres of the bones themselves become hypertrophied (see Plates).

## PART II.

### CHRONIC RHEUMATIC ARTHRITIS CONSIDERED SPECIALLY IN EACH JOINT.

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#### CHAPTER I.

##### THE DISEASE IN THE HIP.

BEFORE I proceed to describe this disease as it affects any of the other articulations, I think it better to advert *first* to the characters it presents when the hip-joint is the seat of it. My apology for adopting such an arrangement is, that I believe the profession to be more familiar with it as it affects the hip, than with the phenomena it presents when any of the other articulations have become affected by it.

The earliest observer whom I can find describing, or rather delineating, the morbid appearance that a long-continued state of morbus coxæ senilis, or chronic rheumatic arthritis of the bones of the hip-joint, impresses on the articular surfaces, is Edwardus Sandifort, of Leyden, who, in his "Museum Anatomicum," published in 1793, has given very graphic illustrations of the alteration in form which

the head of the femur and acetabulum undergo as the result of this disease. This author, however, describes the appearances of the bones only as he found them in the dead body, deprived of all their ligaments and all the surrounding soft parts ; but he does not adduce any living example of it, nor does he seem to be aware of the nature of the disease he has delineated.

For many years this disease, under the designation of *morbus coxæ senilis*, has been accurately described in the clinical lectures delivered in the different hospitals in Dublin, and the importance of distinguishing it from the other affections of the articulation has been pointed out. Mr. Benjamin Bell, in his work on the Bones, has, under the head of "Interstitial Absorption of the Neck of the Thigh-Bone," alluded to it, and detailed many of its symptoms, as well as the morbid changes which the neck of the bone suffers ; and in the sixth volume of the "Dublin Journal," 1835, Professor Smith, in a paper on the "Diagnosis of the Injuries of the Hip," and subsequently in his "Treatise on Fractures," 1847, has given a very good and concise account of this remarkable affection of the joint.

It is now a considerable time (Session, 1831) since, in my clinical lectures, delivered in Jervis-street Hospital, I gave the name of *morbus coxæ senilis* to the disease in question. Having, however, subsequently met with many instances of it, occurring so early as at the age of thirty or forty,

I have since ventured to substitute for this name that of *chronic rheumatic arthritis* of the hip—that is to say, rheumatic gout of the joint—considering it identical in its nature with the disease affecting other articulations, which it is the object of this work to describe.

#### CAUSES AND SYMPTOMS.

As to the *causes* of this chronic disease of the hip-joint I believe little is known. I have heard it frequently attributed to the effects of cold and wet; and I can easily conceive that an acute attack of rheumatic arthritis of the hip, produced by cold, may occasionally merge into the chronic affection now under consideration. I have also reason to think that falls upon the great trochanter have given rise to the first symptoms of this disease; and I have known one instance of the disease to follow on a dislocation of the hip-joint which had been reduced soon after the accident. In many cases no satisfactory cause can be assigned for its origin: I have known it in a few cases to have been hereditary.

The patient complains of stiffness in the hip-joint and about the great trochanter; of a dull, boring pain, which extends down the front of the thigh to the knee. The stiffness is most felt in the morning, when the patient commences to walk; but after some exercise the movements of the joint become more free. Should the patient have walked

very much during the day, the pain is always more severe in the evening. The uneasiness, however, gradually subsides after he has retired to bed. When the patient throws the weight of his body fully on the affected joint, the pain is always increased; but if the surgeon press on the great trochanter, or adopt any other expedient, so as to push the head of the bone even rudely against the acetabulum, these manœuvres are the sources of no uneasiness whatever to the patient. Although we can easily satisfy ourselves that no actual ankylosis exists, still it is evident enough that the motion of rotation is lost, and that flexion is confined within very narrow limits. When we place the patient in a horizontal position, and endeavour to communicate any of these movements to the hip-joint, he complains of some pain, and an evident crepitation can be heard and felt deep in the articulation. The affected limb has the *appearance* of being two or three inches shorter than the other; while, on accurate measurement, the real shortening will be found not to amount to an inch. This greater appearance of shortening than exists in reality arises from the obliquity of position of the pelvis relatively to the spine; and the elevation of the former at the affected side is such, that in the ordinary attitude of standing, the crest of the ilium and the last short rib approach nearer to each other at this side by two inches than do those of the opposite side (Figs. 1 & 2, pp. 56, 57).

The patient walks very lamely, and with the foot

and whole limb greatly everted. The nates of the sound side is unusually prominent, while that of the affected one is quite flat, almost excavated (see page 57, Fig. 2), and no trace of the lower fold of the gluteus is seen. The muscles of the thigh also seem somewhat atrophied; still they do not want for firmness; and we may uniformly observe that the calf of the affected limb is not inferior in size and firmness to the other. When we minutely examine the great trochanter, we find it larger and more prominent than usual; and about the situation of the acetabulum, the horizontal branch of the os pubis, and the lesser trochanter, bony protuberances can, upon careful examination, usually be recognised.

This disease generally appears here as a purely local complaint, and, when once fully established in the hip-joint, rarely extends to the other articulations. We have known, however, the disease, having commenced in the smaller joints, as those of the hand and wrists, subsequently to have affected both hip-joints in the same individual.

The chronic inflammation of the various structures of the hip-joint in which the disease consists is seldom accompanied by any appreciable degree of heat or external swelling of the soft parts; and I have never heard of the inflammation having proceeded to suppuration in this articulation.

The following case will show the necessity of making the profession fully acquainted with this disease, as it proves how very obscure are the early



signs of the affection, and that even the morbid appearances may be confounded with those which are the result of accident.

At the meeting of the British Association, in Dublin, in the year 1835, one of its most distinguished members, Mr. Snow Harris, of Plymouth, afterwards Sir Snow Harris, made the following communication to the Medical Section :—

### CASE I.

“ Sir A. Cooper and many other eminent surgeons had doubted the possibility of union taking place in fracture of the neck of the thigh-bone *within* the capsular ligament.

“ A case had lately fallen under his (Mr. H.'s) notice, which he thought would tend to set the question at rest. About ten years ago, a gentleman, æt. 40 (the celebrated comedian, Mr. Mathews), was thrown from his gig, while he was descending Ludgate-hill. He got up and walked immediately after the accident, but continued lame from that period up to the time of his death. He had been attended by some of the most eminent surgeons in London, but they had not been able to determine whether there was a fracture of the bone or not, but kept him lying on a sofa for nearly twelve months. The injured limb was shortened, the foot everted, the thigh wasted, and, owing to the constant inclination of the body forward on one side, a lateral curvature of the spine took place. Some time ago

this gentleman died of disease of the heart; and Mr. Harris, being anxious to examine the parts, removed the acetabulum and a portion of the thigh-bone, which he presented for the inspection of the meeting. He had found the trochanter higher up than natural, and the neck of the bone shortened: a section of the bone had been made, and the line of union, in Mr. Harris's opinion, was clearly manifest."

When Mr. Harris exhibited this specimen to the Medical Section of the Association, it excited much interest—first, as the subject of the case was an individual well known and much esteemed in this city; and, secondly, as in the announcement of the history of the case it was asserted that it settled in the affirmative the much agitated question, whether the intra-capsular fracture of the cervix femoris was or was not susceptible of osseous union.

The writer was present at the communication of this case to the Section. Upon the presentation of the specimen he at once expressed his doubts that this case, either from its history or post-mortem appearances, should be considered as an example of the intra-capsular fracture, and maintained the opinion that it was a specimen of this chronic rheumatic affection, well known in Dublin at that time under the name of *morbus coxæ senilis*. In this opinion he felt assured when he inspected the acetabulum, which Mr. Harris at the same time presented. In the widening of this cavity, in the complete filling up of the fossa, which is normally des-

tioned to contain the substance called Haversian gland, in the shortening of the neck of the femur, and the depression of the head towards the lesser trochanter, and in the ivory deposition on it—in all these we saw nothing but the usual anatomical character of this chronic disease as it affects the bones of the hip-joint. In this view Mr. Smith, the late Dr. M'Dowell, and other surgeons around, concurred—even Mr. Snow Harris himself seemed quickly to become a convert to our views; and I am satisfied, from what we observed of his liberality, that I have his full permission to communicate this case in its present form to the profession.\*

The upper part of the head of the femur was exceedingly rough on its surface, and of an oval form from above downwards; the axis of the neck was at right angles with the shaft, and seemed to run horizontally from without inwards and backwards, so that the length of the fossa which exists posteriorly between the corona of the head and the posterior inter-trochanteric line, was in this case less than a quarter of an inch—a fossa which we know naturally measures two inches. In viewing the oval form of the head, we conclude the movement of rotation must have been impossible. From the shortening of the neck posteriorly we can infer that the toe and foot must have been greatly everted; and from the depression of the head to the level of the

\* The sketch, Atlas, Plate VII., Fig. 1, is taken from the cast of the head and neck of the femur presented by Mr. Snow Harris to the College of Surgeons, Dublin.

summit of the great trochanter, that the femur must have been nearly one inch shorter than the other. The lamented individual had not suffered from the disease more than ten years, so that the morbid appearances were not to the same amount as we frequently see them arrive at, as the result of this very slow disease.

### CASE II.

The following case is that of an individual who had been, to my knowledge, suffering for many years under this disease.

Patrick Macken, aged seventy-seven years, was brought up as a groom, but for the last seventeen years has been quite unfit for service in consequence of his having been afflicted with a very severe pain in his right hip; from the first attack of which he became lame, and ever since the lameness has been slowly but gradually increasing. In every other respect his health is excellent, except that he has some wandering rheumatic pains in other joints, particularly in the right shoulder. He walks with great labour and pain, and now requires the assistance of a stick in each hand; in the morning his movements are stiff and confined, but they become freer on exercise; in the evening of a day on which he has walked much the pain and stiffness are worse, and increased in proportion to the amount of exercise and labour he has undergone in the day. While in bed, he rests on the affected

side, and suffers no pain whatever, unless he suddenly and incautiously turns himself. As soon as he gets up, and throws his entire weight on the diseased hip-joint, the pain commences; if asked in what particular part of the joint he feels most suffering, he points to the back part of the great trochanter, and to a point which corresponds to the situation of the lesser trochanter; he says the pain shoots from these points down the front of the thigh to the knee.

These pains are sometimes more severe, and sometimes less, without his being able to assign any cause for these alterations; and he cannot observe that the state of the weather has any influence whatever on them.

As he *stands* at rest, he throws the weight of his body on the left, or unaffected limb, while the right leg hangs in front and slightly across the left, and *seems* to be at least three inches shorter; he leans slightly back, and supports himself on two sticks; as he walks, the right foot is considerably everted; and when he moves without sticks (which he accomplishes with the greatest difficulty), he places the whole sole of the foot flat upon the ground. He never, however, now ventures of his own accord to move without the help of two sticks, by the assistance of which he is enabled to walk more quickly. While thus moving along, the heel of the affected limb does not quite reach the ground (Fig. 1), and the lumbar vertebræ undergo great motion. He cannot under any circumstances flex the thigh for-

ward; so that, when he assumes the sitting position, he is obliged to place himself forward on the very edge of the seat, the right thigh remaining in the



FIG. 1.

P. MACKEN'S CASE.—Spine of ilium elevated; right leg shortened; foot everted; the thigh somewhat atrophied; the calf of the leg not diminished.

same line as the axis of the trunk, the leg being usually flexed, and placed under the chair or across and behind the other. He finds the utmost difficulty in putting on his stockings and shoes. He

has scarcely any motion in the hip-joint. When we view the hip in front, and examine it, we see and can feel a considerable bony fulness, corresponding



FIG. 2.

P. MACKEN'S CASE.—Flatness of the nates of the right or affected hip; trochanter elevated and enlarged; thigh atrophied, but calf of leg not diminished; foot everted; limb a little shortened.

to the horizontal branch of the pubis; the trochanter major seems placed very high up, and is extraordinarily large, as if surrounded with ossific depo-

sits. The thigh is somewhat atrophied, being an inch and a half less in circumference than the other; but the calf of the leg is not reduced, and the muscles seem firm. The greater apparent than real shortening of the limb, when he rests on the sound one, arises from the lumbar vertebræ being much curved, the convexity being to the right or affected side, and the pelvis being elevated at the same side; while the real shortening, ascertained by accurate measurement, amounts to only half an inch. If we place the patient horizontally, and attempt to communicate to the hip-joint any movement, as of rotation, flexion, or abduction, a well-marked crepitus is elicited, and the range of motion is found to be very limited indeed; a little abduction is admitted; rotation and flexion are allowed, but to a degree scarcely more than just sufficient to prove that no actual ankylosis exists. The movements give some pain to the patient; but we can press the trochanter firmly, so as to direct the head of the bone deeply against the fundus of the acetabulum, and we can even strike the heel and sole of the foot forcibly, without giving the patient the slightest feeling of pain.\*

\* The above case is a reprint from the Cyclopædia of Anatomy. London: 1839; vol. ii., p. 800:—Hip-joint, Abnormal Anatomy. By R. Adams, M. D. The case has also been subsequently introduced, with the engraving, into the two following valuable works:—Treatise on Fractures, &c. By R. W. Smith, M. D., Professor of Surgery, University of Dublin. 1847. A Treatise on the Hip-joint, entitled, Om Höftleden och Ledbrosken, &c. By Professor Santesson. Stockholm: 1849.



## DIAGNOSIS.

When chronic rheumatic arthritis of the constitutional form affects the hip, many of the smaller articulations are similarly implicated, and the true nature of the disease thereby becomes manifest; but when it appears as a *local* complaint, fixing itself, as it usually does, in one of the hip-joints only, then the disease may be mistaken for sciatica, or for a scrofulous affection of the joint.

The strumous affection, however, occurs generally in children, and in persons under the age of puberty, while this chronic rheumatic affection of the hip seldom appears in any who are under forty years of age. It is true that scrofulous caries of the hip-joint may attack those who have passed the age of puberty; but, whatever is the age of the patient in the strumous case, we observe that the constitution sympathizes with the local disease of the hip-joint; whereas, in the chronic rheumatic affection of the local form, the general health is totally disengaged. In the case of the chronic rheumatic disease, the patient will allow the great trochanter to be firmly pressed inwards, and will even permit the head of the femur to be pushed up with violence against the bottom of the acetabulum without complaining; on the other hand, the individual affected with the scrofulous complaint of the hip-joint shrinks back from submitting to these experiments, instinctively dreading the pain that should be induced thereby.

When we make the patient stand as erect as he can, in the case of the strumous disease of the hip, we observe at once the characteristic attitude of the patient, and position of the affected limb, the general fulness and swelling around the hip-joint; there is to be observed at the same time the wasted condition of the thigh and leg of the affected side. In the chronic rheumatic case, it is true, the thigh will be found also reduced in circumference, but not in firmness, while the calf of the leg is as large as natural. In a word, instead of the general swelling of the nates, and tapering downwards of the upper third of the thigh, which is so remarkable in the scrofulous hip, there is an evident flatness in the gluteal region in the case of the chronic rheumatic affection; and in the last, behind the great trochanter (which is much enlarged and higher up than natural), the normal depression exists (see Fig. 2, page 57).

Some of the symptoms attending on sciatica resemble those of chronic rheumatic arthritis of the hip more than those of the disease before mentioned. In sciatica the age of the patient is always mature, and the experiment of forcing up the head of the femur against the acetabulum gives no pain. In these respects sciatica and chronic rheumatic arthritis of the hip resemble each other; but in sciatica the pain extends along the back of the limb, and outside of the leg, in the course of the great sciatic nerve and its branches, and the pain also comes on in paroxysms.

In the case of chronic rheumatic affection of the hip, when it is a local complaint confined to this joint, the pain at once ceases when the patient retires to bed, and the affected limb is relieved of the superincumbent weight; but in sciatica the pain is as severe at night as at any other time.

When we examine the patient in the horizontal posture, the motions of the hip-joint, if sciatica be present, will be observed to be quite as free as usual; but, on the contrary, in the case of the chronic rheumatic affection, when the surgeon holds the limb, and attempts to flex or rotate the thigh, but little motion can be observed to take place in the joint of the hip, while a peculiar crepitation is perceived in it, and the lumbar vertebræ are found to be *really* the seat of many of the movements which a careless examination might lead one to suppose had taken place in the hip-joint itself. While in sciatica the limb preserves its natural direction, and is of its normal length, in the chronic rheumatic disease of the hip there is an eversion and real shortening of the limb, as well as an enlargement of the great trochanter—all which constitute a combination of circumstances which render the diagnosis between sciatica and chronic rheumatic arthritis by no means difficult.

Before I conclude the subject of the diagnosis of this disease of the hip-joint, I may mention that instances do occur of persons who, having been affected with it, have at the same time suffered contusions of the articulation, or fractures of the cervix

and upper part of the thigh bone, as the immediate results of falls on the great trochanter. These coincidences may be rarely seen ; but, when the symptoms which belong to the previous chronic disease are associated with those which are produced by recent accident in a given case, it must be confessed that there may be found in these coincidences much to embarrass our diagnosis, at least until the previous history of the case be fully ascertained.

A writer in the "Gazette Médicale," in alluding to this disease, says of it :—" C'est une affection particulière, presque entièrement inconnue de nos chirurgiens, et que cependant bien plus que tout autre lésion de la hanche, peut entraîner des erreurs graves dans le diagnostic des fractures du col du fémur."\*

The following case occurred to me in my hospital practice many years ago :—

### CASE III.

CASE OF FRACTURE OF THE NECK OF THE FEMUR, AT ITS BASIS, WITH DETACHMENT OF BOTH TROCHANTERS FROM THE SHAFT OF THE BONE, IN A PATIENT WHO HAD BEEN FOR A LONG TIME PREVIOUSLY TO THE OCCURRENCE OF THE ACCIDENT SUBJECTED TO CHRONIC RHEUMATIC ARTHRITIS OF THE HIP.

Patrick Doolan, aged 75, was admitted into Jer-vis-street Hospital, February 17, 1831, labouring under a severe injury of the hip-joint. The limb presented the following appearances :—

\* Smith, *loc. cit.*, page 127.

The hip was considerably swollen; the trochanter major appeared twice its natural size, and was drawn up on a level with the anterior superior spine of the ilium; a considerable hollow was evident in the groin. The limb was shortened four inches; the foot inverted; the movement of rotation outwards could be communicated to the limb, but the motion was imperfect, and attended with pain. On making extension, and then rotating the limb, an indistinct crepitus was perceptible.

We collected from the patient, that a short time before his admission, while endeavouring to unlock a door, he lost his balance, and fell on a heap of stones on his left hip; that he at once found he was unable to rise, and was immediately carried to the hospital. We found him in a state of exhaustion from pain and the severe shock he had sustained.

The appearances the limb presented excited a good deal of interest and doubt. From the previous history collected as to the case, it was learned that many years ago the patient suffered from a stiffness in the hip; that the limb gradually became shorter; that he contracted a halt; and was obliged to have the aid of a stick in walking; he remarked that he never was confined to his house or bed in consequence of the affection.

The conclusion arrived at, as to the diagnosis in this case, was, that the accident was an extra-capsular fracture at the basis of the cervix femoris, with injury also done to the trochanters major and minor, in an individual who had been for a long time

previously affected with chronic rheumatic disease of the hip-joint. The prognosis, in consequence of the severe and extensive nature of the injury, and of the age of the patient, was very unfavourable.

The patient died on the fourteenth day after his admission.

On making a post-mortem examination, it was found: 1st. That a fracture of the cervix femoris had occurred at its root, close to the trochanters. 2ndly. That the great trochanter, which was much increased in size, was broken off obliquely from the shaft of the femur; the fracture ran in such a direction as to detach the trochanter from the shaft of the bone, leaving attached to the former the insertions of the pyriformis, gemelli, obturatores, and quadratus femoris. 3rdly. The trochanter minor was also broken off, so that the psoas magnus and iliacus had lost all connexion with the femur.

The capsular ligament was found thickened; and when this was freely cut all round, it required the exertion of much force to pull the head of the femur from the socket. The ligamentum teres had entirely disappeared. The cartilage of the head of the bone was almost altogether absorbed, and in its place was deposited a complete enamel resembling ivory, smooth and polished. The head of the bone was altered in shape: it was larger than natural, and flattened on its upper surface; a quantity of bone was deposited all round the head of the femur, where it joins the neck of this bone.

The *acetabulum* was greatly enlarged, and lined

by the same material as that covering the head of the femur; there was no trace of the substance called Haversian gland, and the pit for its reception had entirely disappeared. When the fractured portions of the bone were restored to their original position, it was found that the neck of the femur was quite horizontal, and that from this cause, and from its increased size, the trochanter major was situated above the level of the head of the bone.

One of the most remarkable features in this accident, noticed when the patient was admitted, was the extraordinary shortening of the limb, to the amount of four inches. While some of the shortening in this case was fairly referrible to previous alteration of the head and neck of the femur, from long-continued chronic disease, still more, do I think, was the unusual shortening owing to the peculiar nature of the recent injury, and to the action of muscles.

The fracture was indeed a comminuted one, and therefore the lower fragment yielded more readily to the action of the elevating powers, represented by the gluteus, the tensor vaginae femoris, and the adductors, all inserted below the seat of fracture; while, on the other hand, those muscles which might resist somewhat the ascent of the lower fragment—namely, the psoas and iliacus, and the obturators—were powerless, as they had lost all connexion with the femur.

The *inversion* of the limb (or rather the reason why it was not everted, as it usually is in the ex-

tra-capsular fracture) was fairly attributable to the complete detachment from the shaft of the femur of the eight rotators outwards, already enumerated, which the greater and lesser trochanters give "*points d'appui*" or insertion to.

When this patient was first admitted into hospital, he was in a state of exhaustion, and could give us very little information to assist us to form our diagnosis. The elevation of the enlarged trochanter towards the spine of the ilium; the shortening of the whole limb, greater than ordinarily seen in extra-capsular fracture; the inverted position of the foot—all these, it may easily be imagined, suggested at first sight the erroneous idea that a dislocation on the dorsum ilii had occurred. However, on extension having been made, much of the deformity was removed; and, when the movement of rotation was now communicated, crepitus was produced, and the limb could be (although with pain) everted to a degree incompatible with the idea that in this case any dislocation on the dorsum ilii existed. The limb, when drawn down to the utmost, was still more than an inch shorter than the other. This shortening of the limb, which could not be made to disappear, and the enlargement of the trochanter, were, as the history of the case led us to conclude, really the result of this chronic rheumatic disease, with which the patient had been for many years previously afflicted.



I have never yet heard of a dislocation of the hip-joint having occurred in a person who had been previously affected with this chronic rheumatic disease, but I have known the disease come on as a sequel of a dislocation: the possibility of occurrences such as these should be borne in mind, because we have sufficient evidences of a similar combination of circumstances having obscured the diagnosis of certain injuries and diseases which have been met with in the shoulder, the kindred joint in the upper, analogous to the hip, in the lower extremity.

#### ANATOMICAL CHARACTERS.

In the first part of this work, when referring to those by whose exertions we have been made acquainted with the pathological anatomy of this disease as it affects the bones of the hip-joint, I have adduced the name of Edw. Sandifort of Leyden, as the earliest contributor to our knowledge on this subject. He, in the second volume of the "Museum Anatomicum," published in 1793, has given delineations of some diseased bones of the hip-joint preserved in the celebrated Museum at Leyden. In the description accompanying them, he has not given any name to the disease. We find, however, in the continuation of the "Museum Anatomicum," vol. iv. (1843), that drawings and descriptions of a similar condition of the bones of the hip-joint are introduced by Sandifort, Jun., who refers the mor-

bid appearances, so graphically delineated in both volumes, to *rheumatic disease*.\*

I shall frequently, in this chapter, refer to these specimens and the engravings of them, because I consider them by far the most valuable examples extant of the alterations produced in the bones of the hip-joint by chronic rheumatic arthritis; and that this is the disease with which these bones had been affected, I cannot, for my part, for one moment doubt, because, during the whole period of my professional life, I have been conversant with the morbid appearances this disease impresses on the bony textures; and have, at Leyden, in 1847, personally examined the preparations in question, and compared them with the excellent delineations of them in the "Museum Anatomicum." Indeed, I would add, that in these delineations, which are very numerous, amounting to at least thirty figures as large as nature, is comprehended almost every variety of organic change, as yet known, that chronic rheumatic disease produces in the *bones* of the hip-joint. It is to be regretted that little is mentioned as to the condition of any of the other structures which entered into the composition of these

\* Vol. iv., p. 38. This splendid work, consisting of four vols., large folio, with steel engravings of diseased bones as large as nature, is but little known in these countries. That this work owes its production to royal munificence may be inferred from the words of the dedication of the third volume, 1827, "Gulielmo I., Belgarum Regi augustissimo, Patriæ Patri, artium doctrinarumque fautori."

diseased articulations, except the bones, and nothing seems to have been known of the previous history of any of the cases. The sex of the individuals in whose bodies the specimens have been found alone is given.

The anatomical characters of chronic rheumatic arthritis, as it affects the hip, are very well defined. The *muscles* around the joint are usually of a pale colour, and are by no means so well developed as those of the opposite and sound side, with which (in the *local* form of the disease, at least) we have opportunities of comparing them.

The *fibrous capsule* is much thickened, and of a structure so dense as almost to resemble intervertebral substance, and sometimes plates of bone are deposited in its substance; and indeed I find one instance delineated by E. Sandifort, in which the capsular ligament was almost altogether converted into bone: "Videtur, ferme tota capsula articularis ossificata."\* When the capsular ligament in ordinary cases of this disease is cut through, it is found to contain but a very small quantity of synovia, and what remains of the synovial membrane is usually of a red colour. The reflection of it which lines the interior of the capsular ligament is found to be preternaturally vascular, and is sometimes covered with a layer of lymph.

In many cases the synovial membrane, where it embraces the neck of the femur, is furnished with vascular fimbriæ of a conical form, about one line

\* Vol. II., p. 76, Plate LXXIV., Fig. 1.

in breadth at their basis, and varying in length from one half of an inch to an inch.

In such cases the corona of the head of the bone is absorbed in different points of its circumference, and the small excavations or foveæ are filled up by highly developed red vascular fimbriæ (see Atlas, Plate VII., Fig. 2).

Under the influence of this disease the cotyloid ligament is removed, and the short fibrous bands which stretch across the notch in the acetabulum are converted into bone, leaving beneath the arch thus formed, except very rarely, a small space for the passage of blood vessels into the interior of the joint.

#### ACETABULUM.

In advanced cases no traces of the ligamentum teres, nor of the mass called Haversian gland, exist in the acetabulum. These, together with the cartilages of incrustation which line this articular cavity, are altogether removed, as well as the compact layer of bone which these structures had covered; the cells of the bone, thus exposed, yield to weight and pressure, and become so deeply worn away, that the Haversian fossa is effaced, and the acetabulum becomes converted into a deep cup or excavation, capable of containing the enlarged head of the femur.

When, under these circumstances, we examine the concave surface of the acetabulum in the state in which we usually find it in museums, we observe that the dry bone has a worn and porous appearance ;

and in some places, where the attrition and pressure have been greatest, from the head of the femur, instead of this rough, porous appearance above alluded to, a dense enamel has been formed, and here the surface presents the polish and hardness of ivory. In a few instances I have found the cavity of the acetabulum rendered uniform, not by wearing away of its walls down to the level of the fundus of the Haversian fossa, but by the formation of a plate or lamina of bone which stretched across from one margin of the fossa to the other.\* The acetabulum usually has the appearance of having ascended somewhat on the outside of the os innominatum; to be larger and deeper than natural; and to have its brim beset with bony nodules and asperities. A specimen may be seen preserved in the Museum at Leyden, which will be found to be two inches and a half deep, very broad, and having a sharp and prominent margin, from the posterior part of which is produced downwards and backwards an exostotic growth nearly an inch long, and about the size of the extremity of the little finger; smaller stalactiform growths are seen also in this specimen to pass from the inner margin of the acetabulum towards the foramen ovale.

The brim of the acetabulum is sometimes so much contracted by osseous growths, that, although the head of the femur is capable of being moved about

\* The Sandiforts are the only observers who have noticed this formation, which is, however, by no means uncommon. Vol. II., Plate cxx., Fig. 1; vol. IV., Plate cliv., Fig. 1.

in many directions, it cannot by any means be removed from it. In the language of Sandifort, applied to one of his specimens: "Caput ossis femoris, licet quaquaversum mobile, tamen nulla ratione ab eo liberari queat."\*

On the other hand, we frequently find that the acetabulum, although much enlarged, may be shallower than natural, and of an oval form.

#### HEAD AND NECK OF THE FEMUR.

The direction of the long axis of the neck of the femur in the normal state is from below upwards and inwards, as well as somewhat forwards; whereas the direction of this axis becomes much altered by this disease; for, from its effects, the long axis of the neck will be found to pass inwards at right angles to the direction of the shaft of the bone, as well as somewhat backwards, and the length of the neck will be diminished, particularly posteriorly.

As from all these causes the highest point of the head of the femur is frequently found below the level of the summit of the great trochanter, and the posterior margin of the corona of the head approximates so much to the posterior inter-trochanteric line, we see sufficient in such organic changes of the neck of the bone to account for the permanent shortening and eversion of the affected limb, which we always notice in these advanced cases.

\* Vol. IV., Plate CLIV., Fig. 1.

Sometimes, although the neck of the femur is not really shorter than natural, yet the surface for articulation of the head of the bone with the acetabulum is much increased, at the expense of the surface of the neck all round. The corona of the head in these cases seems to have been added to, by a broad and flat ring of bone, encircling, and at the same time encroaching on the cervix, properly so called. It is to such cases Professor Smith alludes, when he says: "Sometimes the neck of the femur retains nearly its natural length, and yet only a small portion of it is visible when the capsule is removed;" and of which Mr. B. Bell speaks, when he observes "that the neck of the femur appears to be as it were encased in a sheath of osseous matter."

Sandifort also describes a specimen of this kind as follows: "The cartilaginous incrustation which ordinarily covers but the head of the femur had, in this instance, descended so remarkably low down on the cervix femoris, that the articular part of the surface of the head had thereby become much more extensive than usual."\*

*Head of the Femur.*—As under the influence of this disease the acetabulum has been found to have undergone various modifications of shape, so also may we expect to find that the head of the femur shall have assumed a corresponding variety of form.

The removal of the cartilaginous incrustation and compact structure of bone, as well as the substitu-

\* E. Sandifort, *loc. cit.*, vol. II., p. 74.

tion, for these, of a dense enamel, are processes which mark the effects of this disease on the concavity of the acetabulum; so also shall we find from similar causes analogous effects produced on the convex surface of the head of the femur, where subjected to pressure and attrition; such effects are most conspicuous on the upper surface of the head of the femur, where it supports the acetabulum in standing and progression.

The round ligament, as already mentioned, in advanced cases is generally removed from the bottom of the acetabulum; and the extremity of it, which is normally attached to the head of the femur, no longer exists. Indeed, very usually all traces of the pit, or dimple-like depression for it, in the head of the femur are effaced, and the place it had occupied is sometimes smooth, and even eburnated.



FIG. 3.

Effects of long-continued chronic rheumatic arthritis of the hip on the neck and head of the femur.



When we examine the head of the femur in advanced cases of this disease, we generally find that it has quite lost its normal form; that it is usually very much enlarged and flattened, as it were, from pressure exerted on it from above downwards.\*

Or, to use the language of Mr. B. Bell: "It looks as if the head of the bone were forced downwards by the action of some great pressure; and I have seen cases in which the interstitial absorption of the neck had proceeded so far that the head of the bone rested upon the upper part of the trochanter minor."†

We may here observe, that in parts of the head of the femur which are not covered with the ivory enamel so often alluded to, the surface of the head presents a *porous* appearance, as if it were drilled with an infinite number of small foramina. These, in the dry state of the bone, are seen to penetrate to a considerable depth; but I would here remark that, although these pores have attracted much observation from anatomists, they are to be seen only in the dry bone. In the examination of *recent* specimens of this disease, I have found that the pores in the head of the femur were filled up with a very red cellular tissue. In my anatomical examinations of the hip-joint of individuals who had been affected by this peculiar disease, and with the previous history of whose cases I had been acquainted,

\* See also Atlas, Plate VII., Fig. 4.

† Bell on Diseases of the Bones, p. 93.

I have observed that if the hip-joint had enjoyed *motion*, although the pores were thus filled up by this red vascular structure, none of it was to be found projecting beyond the level of the articular surface of the head of the bone ; but, on the other hand, in our anatomical examinations of cases in which *no motion* whatever had existed of the articular surfaces of the hip on each other, a fine vascular cellular tissue was found not only to fill up these pores, but to project out from them, and to form a fine, continuous vascular membrane, which invested the articular surface of the head of the femur and interior of the acetabulum. On pursuing further our anatomical investigations in these last-mentioned cases, we have observed that beneath this vascular layer, just alluded to as covering the head of the femur, no cartilage of incrustation existed ; and when the bones had been macerated, we have noticed that the articular surfaces have presented the usual porous appearance ; but, as there had not been any motion in the hip-joint, no eburnation was observable.\*

When the head of the femur has assumed, as the result of this disease, an oval form, its circumference often presents a rough and nodulated margin, and the asperities on the head may be found to correspond to notches in the margin of the acetabulum. The eminences and depressions in each bone are seen confronted and adapted to each

\* See Index, reference to case of Patrick Hackett.

other; and from such a state of things we naturally may infer that little motion had existed in the joint.

Among the varieties of form which the head of the femur assumes as the result of this disease, we should also mention that it has been found of a globular figure, and at the same time to be greatly enlarged, and very heavy. One of these cases Sandifort has described in the following words:—"Superficies articularis capitis ossis femoris, globosæ figuræ, magnitudinis valde auctæ, partim porosa, partim polita;" and thus concludes:—"Hoc os ponderosum est."\*

Although, in the preceding pages, I have frequently had to observe that enlargement of the head of the femur was one of the most constant of the abnormal conditions to be noticed as the consequence of this disease, and that in general it affected only one of the hip-joints in the same individual, I must here remark that exceptions to these rules may occasionally be found to exist, particularly in cases in which the disease had assumed the constitutional form.

Professor Smith, for example, has called attention to a specimen contained in the Museum of the College of Surgeons, Dublin. The preparation consists of the pelvis and thigh bones of a female, aged 60.

"The heads of both femora (although presenting

\* *Loc. cit.*, vol. iv., Tab. xxvii.

some of the characteristic appearances of the result of chronic rheumatic arthritis) are *diminished* in size; that of the right is slightly elongated. The surface exhibits a very trifling degree of enamelling, and is, as it were, drilled with an infinite number of small foramina, many of which penetrate to a considerable depth. The acetabula are equally porous, and out of all proportion *larger* than the heads of the thigh bone. The increase in size is partly effected by osseous additions to their free margins, and partly by a protrusion of their inner walls into the cavity of the pelvis, where they form two hemispherical bulgings, which diminish the transverse measurement of the pelvis by at least one inch. The bone in this situation is exceedingly thin, and quite diaphanous. It is remarkable that in the joint of the left side the ligamentum teres was present, in a very strong and perfect state, the synovial portion being alone deficient. The absence of porcellaneous deposit on the opposed surfaces of this side may be, perhaps, accounted for by the fact of the patient having been for years confined to bed, during which time, consequently, there was little or no friction between them."\*

The foregoing must be considered to be a very unusual specimen of this disease. The history of the case was unknown; but, from the circumstance of both hip-joints having been similarly affected, it

\* Dr. Houston's Catalogue of the Museum of the Royal College of Surgeons in Ireland: vol. 1., p. 379.

appears to me almost certain that it was the constitutional form of the chronic disease that the woman from whom this specimen was taken had laboured under.

It may be collected from the preceding account of this disease, as it affects the hip-joint, that the sub-inflammatory action of the osseous structures of the joint which exists causes for a time softening of them; and, under such circumstances, these will naturally yield to the influence of the superincumbent weight of the body, and thus would physiologists account for the characteristic shortening and depression of the head and neck of the femur, the gradual extension upwards of the acetabulum on the outside of the os innominatum, all which have been observed as the ordinary effects of this disease. Such are the opinions the younger Sandifort takes the opportunity of expressing on the occasion of his giving a description of some engravings he has introduced into the fourth volume of the "Museum Anatomicum," which exhibit the ordinary anatomical characters of this disease as it affects the bones of the hip-joint. "In these plates are exhibited," says Sandifort, "the degeneration the hip-joint undergoes from rheumatic disease, which first softens, and causes an expansion of the bones. These, in the course of time, afterwards attain a remarkable degree of solidity by the re-introduction of fresh and increased deposits of phosphate of lime."\*

\* *Loc. cit.*, vol. iv., p. 38. 1835.

Thus, according to Sandifort, during the period that the bony articular particles are in the softened condition, they become unequal to bear the superincumbent weight of the trunk; hence this last *descends*, as it were, between the femora, and the acetabula ascend.

The remarkable case lately alluded to, in which the acetabula formed two hemispherical bulgings into the cavity of the pelvis, would also, according to this theory, be explained by assigning the bulging inwards to the influence of the superincumbent weight of the body, causing a yielding of the fundus of the acetabulum at a time when this portion of the bony tissue of the hip-joint was in the softened condition alluded to by Sandifort. The shortened state of the neck of the femur on its posterior aspect, so usually observed as the result of the disease we are here considering, might also, according to the same theory, be attributed to the predominant influence of the numerous rotators outwards acting on the neck of the femur, at a time when this portion of the bone was in the yielding state alluded to. Such explanations are ingenious, but, in my opinion, cannot be admitted as capable of universal application; for in some rare cases of this disease it has been found that the head of the femur, instead of being depressed below the level of the great trochanter, has, on the contrary, been found to have reared its head and neck upwards above the summit of this process, and therefore in a direction quite the reverse of that which the superin-

cumbent weight of the body should naturally have given to it.

Although it cannot be denied that *physical* causes under the circumstances mentioned may be fairly referred to, as *modifying* many of the deviations from the normal form we notice the bones of the hip-joint to present, when affected by this disease, still we cannot but remark, that in the contemplation of the morbid results there is at the same time sufficient to satisfy us that a very active *vital* process is going on in the interior of the bones, as well as in all the structures around the diseased joint, which may be supposed principally to influence all these deviations from the normal state of the articular textures. The thickening of the fibrous capsule, and hyperemic state of the synovial structures; the exuberant growth of bone which we see around, deepening the acetabulum, or surrounding its brim with bony nodules; the enlargement of the head of the femur to the degree that this head shall assume an oval, convex surface, measuring in circumference ten inches and a half, as in the specimen from which the drawing (Fig. 3, p. 74) was taken—all these are sufficient proofs that, besides the interstitial absorption and consequent shortening going on in the interior of the cervix femoris in these cases, a very active condition of the minute arteries exists externally, giving birth to those exostotic deposits which encircle the head, and which spring from the neck of the femur.

Although the state of the articular surfaces of the bones themselves, stripped of all their coverings, has been well described by anatomists, and delineated, it would appear to me that the *recent* appearances of all the structures of the joint which had been affected with chronic rheumatic arthritis have not hitherto attracted as much attention as they should have received ; and here, perhaps, I may be permitted to refer to a communication which I made to the Pathological Society of Dublin, January 19, 1839, which was reported as follows :—

#### CASE IV.

A man, aged 60, had been for a long time under observation in the House of Industry, Dublin, affected with this chronic rheumatic disease of the hip-joint in the *local form*. He died of another disease, and I availed myself of the opportunity thus presented of investigating the anatomical characters of this disease of the hip-joint, and of laying before a meeting of the Society the recent specimen.

I remarked that the hip-joint, viewed externally, seemed to be altogether greatly enlarged,\* and that the acetabulum and head of the femur were each

\* This disease, as it affects the hip-joint in man, bears many points of resemblance to the disease of the hock-joint in the horse, called spavin. There is an analogy between them, not only in the enlargement of the joint and in the eburnation of the articular surfaces, but also in the symptoms and in the species of lameness which is observable in both.



surrounded by an exuberant growth of bone, so that the thigh could be neither fully extended nor abducted, and rotation was impracticable; whenever any movement was communicated to the joint, even at the moment of making the post-mortem examination, a well-marked crepitus was perceptible.

The pelvis seemed somewhat distorted, in consequence of the weight of the body having been so long thrown on the opposite and sound limb in walking, and also from the elevation of the affected hip-joint. The spinous process and crest of the ilium of this side were very much incurvated, so as to present much the same appearance as these processes do in ordinary cases of caries of the hip-joint of long standing, or as they do in the case of congenital malformation of this articulation. The muscles were all of a yellowish hue; the capsular ligament was greatly thickened, and of a structure like to intervertebral substance. When the joint was opened, a very small quantity of viscid synovial fluid escaped. The acetabulum was much excavated, and at the same time deepened, by a rising brim of apparently *new growth*; a cartilaginous body, the size of a small nut,\* was found *loose* in the interior of the joint. The bottom of the aceta-

\* The following remark, which I copy from the Archives générales de Médecine (tom. XII., 1846; par Dr. J. M. Blonden), shows us that the details of such cases as the foregoing are not useless:—"L'Articulation de la hanche est jusqu'ici la seule où l'on n'ait pas trouvé ces corps étrangers."—Page 363.

bulum was fully two inches distant from the brim ; the cartilage and Haversian gland had disappeared. The head of the femur and the acetabulum presented the usual anatomical characters of this disease ; they were covered with porcelain-like deposit.

It has been remarked that, as a consequence of this disease, the head of the bone is sometimes enormously enlarged, and the acetabulum shallow ; and that in other cases, on the contrary, the acetabulum forms a true deep cup, which so closely embraces the head of the femur that it is with difficulty extracted from it. The latter was the case in this instance. I here took occasion to observe that I wished to draw the attention of the Society to the state of the vascular system of the surface and interior of the bones, as well as of the synovial system, to be observed in these cases, as these interesting points had not been hitherto attended to. I observed that, when we looked into the interior of the acetabulum, it was seen to present a bright red colour, owing to the increased vascularity of the bony tissue, for the cartilage of incrustation had been removed. The head of the femur was much depressed, somewhat enlarged, and presented a blunt conoidal form (see Atlas, Plate VII., Fig. 2).

The basis of the head had approximated within a quarter of an inch of the inter-trochanteric lines ; much of the surface of the head was eburnated even where the fossa or dimple for the round ligament had existed.

The rest of the surface of the enlarged head presented a pink colour; this blush was deepened in several parts by the surface being interspersed with small red dots or spots: these, when closely examined, are found to correspond to small pores in the head of the bone. And here let me delay a moment to remark that these are the *pores* which are concealed from view by the red cellular tissue with which they are filled up in recent specimens of this disease, but which constitute one of the anatomical characters of it in the dry bone, with which we are so familiar.

The corona of the head, when examined posteriorly, seemed undermined, as it were, and excavated in parts; and here a highly vascular fibro-cellular tissue appeared to be formed into tufts and villous processes, which occupied foveæ or depressions in the back part of the neck of the femur, and were here lodged under the shelter, as it were, of the projecting corona of the head, thus protected from pressure and attrition during the movements of the articular surfaces.

When we examined the loose folds of synovial membrane which invested the inferior part of the cervix femoris, they also were found to be of a bright scarlet colour, and conical-shaped vascular fimbriæ were observed growing from the synovial membrane of this portion of the neck of the bone. These, both in form and size, resembled somewhat the elongated papillæ found in the inside of the mouth and tongue of herbivorous quadrupeds, ex-

cept that their fimbriæ were soft, had a villous surface, and were of an intensely red colour.\* This, I remarked, was the second case I had met within a few months, in which these productions from the synovial membrane of the neck of the femur had existed, and they seemed to me to be specially the effect of chronic rheumatic disease.

#### CASE V.

With a view to illustrate this disease further, I may refer to a communication made by the late Dr. Colles to the Pathological Society of Dublin, of a very well marked case of this chronic disease of the hip. The case was that of the late Dr. Percival, who died of disease of the bladder, aged 82 years. He left directions with his family that a post-mortem examination should be made of his body, and that the result should be laid before the Pathological Society. Accordingly, at the meeting held in Trinity College on the 23rd March, 1839, Dr. Colles made the following communication:—He said he wished to lay before the meeting that day the history of the case of a gentleman lately deceased, with whom many of those there assembled had been for years well acquainted. The gentleman he alluded to was the late Dr. Percival, one of the most distinguished physicians of his day. Although Dr. Percival had attained the age of 82 years, he had

\* See Coloured Drawing, Richmond Hospital Museum, No. 158. Atlas, Plate XL, Fig. 2, B.

experienced for many years of his life most severe sufferings; some of these latterly arose from an organic disease of the bladder, of which he died; but for twenty years previously to the date of his decease he was afflicted with that chronic disease called morbus coxæ senilis. He had had this painful affection latterly in both hip-joints.

So far back as the year 1818, Dr. Percival first complained of pains in his hands, which he considered to be of a mixed nature, partaking somewhat of gout and rheumatism.\* These pains occasionally interfered with his ability to write his prescriptions, for which purpose he sometimes made use of any friend in consultation with him. Subsequently to the attack of these severe pains in the hands and wrist-joints, which were at times accompanied with considerable swelling, that is to say, about the latter end of the year 1820, he began to complain of pain in his right hip-joint. This he at first disregarded; but at length he applied a blister behind the trochanter, and determined to give himself for a day or two some rest from his professional business. But from this application, and its consequences, he was confined to the house for a fortnight. The dis-

\* To show the difficulty Dr. Percival himself experienced in giving a special name to his disease, I may mention—I have it from Dr. Cheyne—that to an unprofessional friend, who casually asked him whether it was gout or rheumatism with which he was affected, he replied, in his well-known characteristic manner:—"I do not look upon my complaint, strictly speaking, to be either gout or rheumatism, but I consider it to be *the spurious progeny of both.*"

ease gradually became more troublesome, and interfered much with his power to go through the extensive professional duties he was called upon to perform, he being unable to walk without the assistance of a stick, and subsequently of a crutch.

Latterly, Dr. Percival could not prevent his *right leg from crossing over the left; in this position he found ease from suffering*, and to remove the limb from it gave him considerable pain. When he sat in this attitude he felt tolerably free from uneasiness, and he could gradually raise himself nearly to the erect posture without much suffering, provided he did so slowly, cautiously moving the pelvis on the head of the femur. These slow and cautious movements from the sitting to the erect posture did not give pain, and he frequently called the attention of his medical attendant to the very loud crackling noises they occasioned. He had all the ordinary rational signs of the disease, the shortening and eversion of the limb, and the characteristic walk. There was considerable difference between the date of the right hip-joint having become affected and that of the left, which was not implicated in the same diseased action until the year 1834.

The appearances of the joint as exhibited by Dr. Colles were quite characteristic of the disease; there was the usual flattening of the heads of the bones, the ivory deposit replacing the absorbed cartilage; a similar deposit on the acetabulum; total absence of the ligamentum teres; shortening of the neck of the femur; and osseous depositions in various situa-

tions. One of these lay in front of the right acetabulum, and the anterior crural nerve, flattened and redder than natural, passed over it: this appeared to Dr. Colles to explain the great amount of suffering experienced by Dr. Percival during the latter part of his life: he could not prevent the right limb from crossing over the left, &c. &c. The right limb was shorter than the left. Upon removing the left femur from the socket, the head of the bone was found intensely red and vascular, and a number of small pieces of bone were found connected with the capsule; there were *none loose* in the joint, as was supposed from the very peculiar grating or rattling sound heard during life, whenever the limb was moved; both thigh bones were found to be remarkably heavy and dense.

Dr. Colles, in his observations on this case, remarked that both hip-joints were affected—a circumstance in his experience rarely noticed in this disease. Another circumstance he wished to draw attention to was, that this disease was usually observed to affect the hip-joint in those who belong to the labouring classes; and, he added, indeed so much so, that by many it was supposed to be the result of bodily fatigue, exposure to wet, and over-exertion. These causes, however, could have had no influence in the development of the disease of the hip in this case; because, even in his youth, Dr. Percival never had indulged in violent or active exercise; and it might be truly said of him, scarcely any man had walked less. Nor could it be said to

arise from rheumatism, for there was no sign of rheumatism in any other part of the body. Was it, then, from gout? Dr. Colles did not think it was; he had disease of the hip-joint, but this was a disease which he had not observed in gouty persons.

The only remaining observation, Dr. Colles said in conclusion, he had to make was, that the femoral artery, where it passed over the forepart of the acetabulum, was very much ossified.



## CHAPTER II.

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### THE DISEASE IN THE SHOULDER.

THE shoulder-joint in the upper is analogous to the hip-joint in the lower extremity. Bichat considers these two articulations physiologically together, and makes them constitute his first class or primary division of the joints.\* So may we be permitted to contemplate them together pathologically. Indeed, as there are many and peculiar points of resemblance in the symptoms and anatomical characters of this chronic disease, as it affects the hip and shoulder-joints, I think I may next pass advantageously to the consideration of it in the latter, before I proceed to describe it in any of the other articulations.

### CAUSES AND SYMPTOMS.

The commencement of this disease in the shoulder is frequently attributed by the patient to an accident—such, for example, as a fall on the

\* “Les articulations scapulo-humerales et ileo-femorales en sont des exemples, elles le composent presque exclusivement.”—Bichat, *Antat. générale*, tom. II., page 179.

shoulder, or to a sprain of the joint ; and in these cases the consequent disease has usually appeared quite as a local affection : more frequently this chronic complaint would seem to have a constitutional origin, having sprung out of the remains of rheumatic fever ; and in such cases both shoulder-joints, as well as many of the other articulations, will be found to be symmetrically engaged.

The patient complains of feeling pains in the shoulder-joint, which, like those of rheumatism, are variable, and seem to be under the influence of changes in the atmosphere. He states that he feels a stiffness in the joint, and is conscious of a crackling sensation in it, particularly when he first moves it in the morning. In the very early stages of the disease a fluctuation of fluid is sometimes perceptible through the soft parts which cover the articulation anteriorly. This fluid after a time becomes absorbed, and then the shoulder presents a wasted appearance ; the prominences formed by the bony processes around the joint become conspicuous. The head of the humerus is generally observed to be a little elevated, advanced, and somewhat approximated towards the median line. When we view the articulation in profile (if we may so say), the amount of the advancement of the head of the humerus is more readily appreciated ; and when we look at the joint from behind, a very remarkable abnormal depression is noticed, corresponding to the space which exists between the posterior edge of the glenoid cavity and the head of the humerus.

If the disease be of the *local* form, and only one shoulder-joint be affected, these appearances become the more remarkable when we compare with each other the morbid and the sound articulation. As the disease proceeds, the voluntary motions of the joint become restricted within very narrow limits; the patient can abduct the elbow to the extent of a few inches from his side, but cannot elevate the arm nearly to a horizontal level. The motions he is capable of performing are chiefly confined to what are termed by him underhand movements. Rotation of the humerus on its longitudinal axis cannot be accomplished by the will of the patient, nor by the hand of the surgeon examining the limb; and in confirmed cases of this affection, when the arm is moved from the side, the scapula will be seen to rotate and follow every movement of abduction; yet the head of the humerus is under some circumstances susceptible of an abnormal degree of mobility. For example, although the summit of this bone may be found (in the ordinary form of this disease) to be placed above its normal level, and to be situated several lines higher (see Atlas, Plate x., Fig. 7, A) than the coracoid process, still, if the arm be grasped by the surgeon, it can be drawn down, and the head of the bone may be momentarily placed beneath the coracoid process. The shoulder will then assume all the appearances usually assigned as the marks of the case styled by Sir A. Cooper "*partial luxation of the head of the humerus forwards and inwards.*" Sometimes adhesions

may have occurred, which retain the humerus upwards towards\* the acromion, and prevent these movements: on the other hand, *partial* luxations may take place in other directions besides those above alluded to; and in rare cases even *complete* dislocation of the head of the humerus may be the result of a long continuance of this disease in the shoulder-joint.\*

#### DIAGNOSIS.

It has been already stated that chronic rheumatic arthritis may appear in the shoulder as a symptom of a general constitutional disease, or it may assume quite the form of a local affection. In the former, the history of the case, the general rheumatic pains the patient reports himself to suffer from, as well as the symmetrical nature of the affection, all declare the case to be one of chronic rheumatic disease which cannot well be confounded with any other.

In the local form of chronic rheumatic arthritis of the shoulder only one articulation is affected, as is the case in articular caries of the bones which form the joint. In both these last-mentioned cases crepitus is elicited on moving the articular surfaces on each other; in both the symptoms of chronic arthritis exist; but the efforts to produce crepitus, and the pressing together of the articular surfaces, cause, in the case of articular caries, so much pain,

\* See Maily's and Stafford's cases, Index.

that the patient shrinks back from our attempts at making these trials; while, in the ordinary case of chronic rheumatic arthritis of the shoulder of the local form, we find we can press the head of the humerus firmly against the glenoid cavity without giving any pain to the patient, just as we can, in the case of the same disease when it affects the hip-joint, press the head of the femur against the acetabulum without causing the least uneasiness to the patient. There is more pain, more wasting of the muscles of the arm and forearm, and more sympathetic disturbance of the constitution, in the case of articular caries, than in that of chronic rheumatic arthritis; and, while the former proceeds either to suppuration or ankylosis, these, we may say, do not occur in the latter.

#### ANATOMICAL CHARACTERS OF CHRONIC RHEUMATIC ARTHRITIS OF THE SHOULDER.

When we anatomically examine the shoulder-joint of a patient who had long laboured under this chronic disease in this articulation, we notice, on removing the integuments, that the deltoid is unusually pale, and that the interstices between its fibres are occupied by an unhealthy-looking fat. This muscle, and the subjacent capsular muscles, are in a state of atrophy. The capsular ligament is generally altered in form and structure, and this sac will sometimes be found to have abnormal attachments to the acromion or coracoid process (see

Atlas, Plates II. and III.), while its union to the anatomical neck of the humerus has been occasionally found to be interrupted, allowing of an opening through which the head of this bone can pass (see Atlas, Plate X., Fig. 5, A). The capsular ligament is usually increased in thickness; its fibres are hypertrophied; and even osseous particles have been found in its substance.

On the other hand, it has occasionally proved on examination to be attenuated as to its structure, and even reduced to synovial membrane merely. In some examples this capsule is observed to be very capacious, as if it had never recovered the over-distention it had suffered in the early stage of the disease; the subdeltoid bursa occasionally communicates freely with the general cavity of the joint.

When *the interior* of the capsular ligament is examined, it will be found to bear evidence of having been the seat of chronic inflammation. Bunches of long, organized fimbriæ hang into the interior of the synovial sac, and many of these vascular fringes, which in the recent state are of an extremely red colour, are seen to surround the corona of the head of the humerus (Atlas, Plate XI., Fig. 1.)

We also notice rounded cartilaginous productions appended by means of membranous threads to the free surface, internally, of the various structures which compose the joint. Some of these "foreign bodies" are small; others large; some are round (see Plates II. and III.). Indeed, their shapes are various: one of these bodies I have seen an inch

and a half long, of a crescentic form, its cornua embracing horizontally the neck of the humerus, to which it was attached by means of two short membranous pedicles, the prolongation of the cornua above mentioned (Atlas, Plate II., *g*).

Besides these cartilaginous "foreign bodies," also called "pendulous bodies," we occasionally find, as the result of the disease we are adverting to, bony bodies of an irregular form, added to the edges of the glenoid cavity, deepening it, and increasing the articular surface for the reception of the head of the humerus, which is usually in such cases much enlarged. These bony bodies are of the class I have ventured to name additamentary bones (see Atlas, Plate IX., Fig. 7, D).

TENDONS.—Should we have an opportunity of examining the anatomical condition of the tendons in and immediately around the shoulder-joint in any case in which the disease had existed in an early stage, we shall find that these structures resemble tendons which had been for a long time macerated, and that they have their fibres widely separated from each other, as it were about to resolve themselves into their primitive elements. We have preparations in the Richmond Hospital Museum showing this commencing state of disintegration of the tendons of the capsular muscles.

The tendinous insertions of the subscapular, supra, and infraspinatus, and teres minor muscles, are sometimes found detached from the tubercles of the humerus.

As to the tendon of the biceps, except in those cases in which an opportunity is afforded to us of examining a shoulder-joint in which this disease is in an early stage, we usually observe that the whole of the intra-articular portion of it has been removed. The remains of the portion of this tendon of the biceps external to the capsule will be found to have contracted firm adhesions to the summit and edges of the bicipital groove.

In some very rare cases this tendon has been found flattened and spread out, though still preserving its ordinary position in the synovial cavity.

In other examples this tendon may be seen to be thrown off the summit of the humerus, and to lie internal to it, as I shall just now have occasion to show;\* and, moreover, many cases of this disease in the shoulder have been met with in dissection, in which this displacement of the long tendon of the biceps internally was double or symmetrical.

**BONES.**—The head of the humerus is generally much enlarged; it assumes appearances the consequences of this peculiar disease, and acquires characteristic forms, which cannot be easily mistaken for the effects of any other disease or accident.

Sometimes the surface for articulation with the glenoid cavity will be found to occupy the lateral part of the head, leaving the tuberosities and anatomical neck of the bone free, presenting as to its articular surface an ovoidal outline, the narrowest

\* See Maily's case.



part (see woodcut, Fig. 4, A), being placed posteriorly towards the axilla.



FIG. 4.

P. DOSOGHROE'S CASE.—Right humerus, anterior view; the articular surface much everted.

In many instances the whole summit of the humerus, together with the upper part of the greater and lesser tubercle, and the highest part of the bicipital groove, are included in the articular surface. The semicircular sulcus which marks superiorly the anatomical neck of the bone and insertion of the capsular ligament is effaced; some of the articular cartilage, we find, has been removed from the head of the bone, which in some places pre-

sents a porous appearance. In other parts, in place of the cartilage, there is a polished ivory-like surface. The portion of the bone which thus presents this polished surface is the very summit of the humerus, and this is the part which will be found evidently to have been for years in habitual contact with the under surface of the acromion and coracoid processes, where these bones assist in forming portions of the new and abnormal cavity for the reception of the head of the humerus. The basis of the head, in the line where it joins the shaft of the humerus, is studded round with granular osseous productions, which give to it a characteristic appearance (see Atlas, Plate III., Fig. 3, B, B). By these vegetations of bone we are reminded of the analogous appearance which the corona of the head of the femur presents when affected by the same species of morbid action.

Lastly, we have to advert to the anatomical characters of the new and abnormal socket formed for the reception of the altered head of the humerus.

This new cavity is composed of two portions, which, however, will be found to have become almost continuous with each other. The original glenoid cavity (generally much enlarged) forms one of these portions; the coraco-acromial vault the other. By the coraco-acromial vault we mean a concave surface, looking downwards, formed internally by the coracoid process, and externally by the acromion; the intervening space being filled up in front by the proper triangular ligament of

the scapula, and completed behind by a portion of the under surface of the acromial end of the clavicle (see Atlas, Plate III., Fig. 2, A, B, E). This coraco-acromial arch overhangs much the head of the humerus, and its inferior surface in the normal state we know is not articular, but, on the contrary, is separated from the head of the humerus, which is beneath it, by an interval of about three or four lines, measured in vertical height. This interval is normally occupied by the long tendon of the biceps and a portion of the capsular ligament passing from the upper margin of the glenoid cavity to the humerus, the capsular ligament having above it the tendon of the supraspinatus, the subdeltoid bursa, much cellular tissue, and the fibrous bands which pass from the coracoid and acromion processes to the humerus.

Under the influence of the most usual form of this disease, all these parts normally intervening between the head of the humerus and the coraco-acromial arch, or vault, are absorbed, and the superior extremity of the head of this bone comes into contact with the concavity of the arch, without the intervention of any structure whatsoever, so that the head is constantly pressed against the under surface or concavity of the coraco-acromial arch; and not only do the processes of the scapula, which form this arch, show manifestly the effects of attrition, but the outer portion of the acromial end of the *clavicle* does so equally (see Atlas, Plate II. A, and Plate III., Fig. 2, A).

All these portions of bone are rendered concave by pressure from below, and are usually covered by a porcelain-like deposit, corresponding to an analogous polished surface, which covers the convexity of the summit of the humerus.

ACROMION.—In many cases in which the shoulder-joint has long been the seat of this chronic disease, the acromion process has been found traversed in the original line of junction of its epiphysis by a complete interruption of its continuity, *as if fractured*,—I say, *as if fractured*, for I am convinced that this solution of continuity of the acromion process is not really a fracture produced by violence, but a lesion, which so frequently exists in combination with chronic rheumatic arthritis of the shoulder, that I feel compelled to look upon it, in these cases, as a peculiar organic change, the result of chronic rheumatic disease. I do not pretend to account for the separation of the acromion process into two portions, nor can I say why it is that the division occurs in the original line of junction of the epiphysis, particularly at the late period of life at which we generally witness this phenomenon. Sometimes the solution of continuity in this line is scarcely discoverable without close examination; as a proof of which I may mention, that I have known one instance of chronic rheumatic disease of the shoulder-joint brought forward by an excellent anatomist, and no mention was made by him of the lesion in question, either when he was publicly alluding to the case, or in the printed account

given of it. The specimen, however, on which were grounded his observations was afterwards subjected to a new examination, when a complete solution of continuity in the bony tissue of the acromion process was discovered.

On the other hand, although the acromion process may be found separated into two portions, and the line of division have originally occurred in the usual place, still these two portions may after a lapse of time be seen widely separated from each other, the fibrous tissue which had closely united them having from some cause become elongated.

Professor Smith agrees in the view that the separation in the cases in question *almost* invariably occurs where in early life the epiphysis joins the remainder of the acromion process; but still mentions that he has "*in one instance found the entire of the acromion separated from the spine of the scapula.*"\*

In *some* of these cases I have found the acromion in a state of hypertrophy, in others, in a state of atrophy, but in no case did there seem to be any attempt at ossific deposition on any of the surfaces of the separated portion of the acromion—a circumstance which might be expected if a fracture really had occurred.

I have so frequently, in making anatomical examinations of the shoulder-joints of those who had

\* Smith on Rheumatic Arthritis of the Shoulder, Dublin Quarterly Journal, May, 1853.

been afflicted with this disease, met with this lesion in the acromion process, in the line of junction of the epiphysis with the rest of the scapula, that I have many times expressed my conviction that the lesion was to be attributed to disease alone; but when I published any observations on this matter, I had not the means of adducing the *proof* of the correctness of this conclusion, which can be drawn, I imagine, from the lesion being found to be double, or symmetrical, in the same individual.

This proof I can now supply, by referring to a case brought before the Pathological Society of Dublin, by Professor Smith, who exhibited the right and left scapulæ of the same individual, who apparently had long suffered from the effects of this disease in almost all his joints in general, and in his shoulder-joints in particular.

In this case *both acromion processes* had been separated from the scapulæ, in their original line of junction of the epiphysis with the rest of the bone. Nothing was known of the previous history of this case, as to whether the patient had at any time met with any accident; but I think we may safely infer that the double lesion here mentioned was clearly a morbid change, the result of that disease which it is the object of these pages to elucidate; and I may moreover add, that among the specimens hereafter to be alluded to, as adduced by Dr. J. Gregory Smith (of Leeds,), and which we presume to have been cases of chronic rheumatic arthritis, will be found a similar example mentioned of the detach-

ment of the extremity of the acromion process from the spine of the scapula on both sides in the same individual: London Medical Gazette, vol. XIV.

I have stated that the bones entering into the formation of the shoulder-joint are very *generally* enlarged, as a consequence of this chronic disease having for a considerable time existed in the articulation. It is right, however, here to observe, that very extensive inquiries into the pathological anatomy of this peculiar affection, as it presents itself in the shoulder, will prove that some exceptions to this rule may be occasionally met with; and that, instead of the bones entering into the formation of the shoulder-joint being found hypertrophied, they may be discovered, on the contrary, to be in a state of atrophy, or portions of these bones may be removed altogether as the apparent result of this chronic rheumatic disease.

That I may not appear to have been singular in having observed the various changes which the acromion process and neighbouring bones have undergone, as the result of this disease, I may refer to the account of a dissection of a case given by Cruveilhier, in which the affection, which he describes under another name, but which I have called chronic rheumatic arthritis, was so general in the system of the patient that there was scarcely any articulation in his body found exempted from its effects. When adverting to the anatomical changes observable in the region of the shoulder in this example, he says: "*The external extremity of the cla-*

*vicle and the neighbouring part of the acromion were in a great part destroyed," &c.*

In the Museum of the Dublin College of Surgeons will be found a preparation of a shoulder-joint, which is styled by the late Dr. Houston, in his Catalogue, a specimen of *chronic rheumatic arthritis* of the shoulder ; and that it was correctly so styled may be inferred not only from the well-known accuracy of the lamented pathologist, but from the appearances of the joint, which are described in the Catalogue :\*—The bunches of synovial fimbriæ hanging into the synovial cavity of the joint ; the existence of hydrops articuli, or over-distention of the sac by an albuminous fluid ; the deficiency of the intra-articular portion of the tendon of the biceps, mentioned in the account given of the case,—all these show the disease to have been rightly designated. I have carefully examined this preparation lately with the intelligent Curator, Mr. Carte, and we observed that the acromial end of the clavicle is unsupported, and that the acromion process has been removed for the amount of an inch in extent ; that which remains of it is thinner than natural, and is in a state of atrophy.

**CORACOID.**—The coracoid process is not usually found so much altered by this peculiar disease in the shoulder as the acromion ; but I have found its under concave surface, in some cases, to have

\* See preparation in the Museum of the College of Surgeons, Dublin : Catalogue, vol. II., page 397, E. b.



become truly articular, or to have entered into the formation of the shoulder-joint, and beneath to have presented a broad glenoid-shaped surface, look-



FIG. 5.

P. DOXOSKOP'S CASE.—Right scapula and glenoid cavity, with a sharp outline, nearly of a circular character.

ing downwards, which had been smoothed off from frequent contact with the head of the humerus ;

while the breadth of the process had been at the same time much increased (see Atlas, Plate II.).

**GLENOID CAVITY.**—The glenoid cavity of the scapula, under the influence of this disease, is generally much enlarged; its surface appears preternaturally excavated, its brim being usually elevated into a sharp margin. The glenoid ligament and cartilage of incrustation are removed; some parts of its surface are porous, and some are covered with a porcelain-like enamel. Near to the margin (Plate IX., Fig. 7, D) of this cavity, from which the capsular ligament arises, we often observe osseous productions attached to the capsular ligament, adding depth to the receptacle for the enlarged head of the humerus. In some examples we find that, by becoming abnormally wide at its upper part, the glenoid cavity loses much of its ovoidal figure, and approaches in its outline more to a circular form (Fig. 5).

Sometimes the head of the humerus occupies its upper portion, and remains habitually in contact with the under surface of the acromion and coracoid processes, thus leaving the lowest part of the glenoid cavity unoccupied.

On the other hand, it has occurred to me to meet with examples the very reverse of the foregoing, in which the head of the humerus was found to have descended on the axillary margin of the scapula, where an addition had been made to the lower part of the original socket to receive it (Atlas, Plate IX., Fig. 7). And, lastly, I shall have to refer to a case

in which part of the head of the humerus remained within the glenoid cavity, while another part of it occupied the neighbouring portion of the subscapular fossa. Under all these varied circumstances, the glenoid cavity and the head of the humerus shall be found to have assumed appearances likely to be mistaken for the effects of accident, but which I shall endeavour to prove are the result of the disease we are in this place considering.

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Those who carefully study the anatomical characters of chronic rheumatic arthritis of the shoulder cannot fail in the course of their investigations to observe many deviations from the normal state of the joint, the result of this disease, which are well calculated to mislead those who are unacquainted with it, and to which we may here advantageously advert.

For example, it has been repeatedly remarked, on making the post-mortem examinations of the shoulder-joint of those who had been affected with chronic rheumatic arthritis, that the intra-articular portion of the long tendon of the biceps was absent from the joint, although adherent outside to the summit of the bicipital groove (see Atlas, Plate III., Fig. 3, c). This removal of a portion of the tendon of the biceps strikes the observer who is unacquainted with the ordinary effects of this disease as a direct proof that the tendon had been "*ruptured*" by accidental violence, and that a partial luxation

of the head of the humerus has been the consequence.

Another character of this disease is, that the humerus has a very general tendency to pass upwards towards the under surface of the coraco-acromial vault, and, besides the removal of the tendon of the biceps, the superior part of the capsular ligament is observed to be deficient (see Atlas, Plate x., Fig. 5). Those who do not know that this perforation is a consequence of slow disease, which has been frequently observed, immediately take it for granted that the same supposed accident which ruptured the tendon of the biceps had also caused the head of the humerus to be partially dislocated upwards, and the superior part of the capsular ligament to be at the same time perforated.

If, in addition to these abnormal appearances, small portions of bone, as if fragments broken off from the margin of the glenoid cavity, are found to be present, as they frequently are (see Plate III., Fig. 1, and Plate IX. Fig., 7, D), this also is an appearance calculated to confirm an erroneous impression that some external violence has been the source of it. If, moreover, the acromion process be found divided, as it frequently is, into two portions (see Plate III., Fig. 2, B, E), the prejudice in the observer's mind, we can easily imagine, may be strongly in favour of the idea that accidental violence has been the origin of these many and combined phenomena.

But, notwithstanding all these lesions—namely,

the total disappearance of the articular portion of the tendon of the biceps, the perforation of the superior part of the capsular ligament by the head of the humerus, and the separation into two portions of the acromion process,—I feel convinced that all these phenomena combined should by no means be considered as proof of any accident having occurred to produce them; but, on the contrary, be looked upon as the usual result of chronic rheumatic arthritis of the shoulder. The tendon of the biceps in all those cases of presumed accidents is *said* to be ruptured, yet the chronic disease of the shoulder-joint is frequently found to affect both shoulder-joints in the same individual, and the long tendon of the biceps in these cases to be removed on both sides. It is easy to conceive that this double lesion may be the effect of disease, but it is difficult to imagine how any accident could occur to rupture the tendon of the biceps in both shoulder-joints; nor is it very easy to admit that the long tendon of the biceps can be readily ruptured in *partial* dislocations of the humerus from accident, when we know that this tendon is rarely, if ever ruptured, even in *complete* luxation of the bone. The statement made in the report of various cases in surgical works, and in catalogues of museums, in which we find it briefly noted, “that the tendon of the biceps was found ruptured,” has been made by the writers confessedly without any knowledge of the previous history of the case, the anatomical characters of which they are describing. On this account I feel

the less delicacy, after long and patient consideration of this subject, in expressing my conviction that the tendon of the biceps in the numerous cases published was not, as was supposed, ruptured by accident, but that it was absorbed as the result of disease.

I have thought it necessary to enter into this subject thus minutely, because I am convinced that up to the present hour these remarkable appearances when met with have been misunderstood even by some of the most intelligent anatomists and physicians:\* this circumstance may appear, perhaps, capable of explanation, by recollecting that the disease generally runs a long course, is not in itself

\* Although for the last twenty-seven years the author has, in various places, continued to express these opinions, they seem to have been neither refuted nor adopted, and therefore they are again repeated here.

In an able memoir on Chronic Rheumatic Arthritis of the Shoulder, by Professor Smith, contained in the February and May Numbers of the Dublin Quarterly Journal of Medical Science, 1853, he gives a critical analysis of twenty-four cases, aduced by different authors, as examples of the result of injury of the shoulder, but which he clearly shows to be really specimens of chronic rheumatic arthritis.

"It is true," he says, "that many of them were published at a period when but little was known of this remarkable affection; their authors are, therefore, to a certain extent excusable for having fallen into error respecting the nature of the morbid appearances which they have described; but it is also true that very many have been recently placed upon record, although we now possess full information respecting the symptoms, diagnosis and pathology of chronic rheumatic arthritis, no matter in what articulation it may be seated."

fatal; and hence, although the practical medical man may have had numerous opportunities of witnessing the symptoms of this disease in the living, he may never have had an opportunity in any case of informing himself of the true relation subsisting between the symptoms of this disease of the shoulder-joint as observed in the living patient, and the phenomena which the post-mortem examination of the same shoulder-joint might have presented. On the other hand, when anatomists have heretofore discovered accidentally in the dissecting-room appearances which we *now* know to be truly those of chronic rheumatic arthritis of the shoulder, they, unacquainted with these morbid appearances, have been easily led to draw erroneous conclusions respecting them, and to refer them to accident. The following case, therefore, may be useful; for here we have presented to us the symptoms of this chronic disease of the shoulder-joint which affected the patient during life, and the morbid appearances which the post-mortem examination of the same articulation revealed.

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## CASE VI.

CHRONIC RHEUMATIC ARTHRITIS OF THE SHOULDER, THE SYMPTOMS OF WHICH STRONGLY SIMULATED THOSE ASSIGNED BY SIR ASTLEY COOPER TO THE SUPPOSED CASE OF PARTIAL DISLOCATION OF THE HEAD OF THE HUMERUS, FORWARDS AND INWARDS FROM ACCIDENT; WITH THE POST-MORTEM APPEARANCES OF THE AFFECTED ARTICULATION.

J. Byrne, a servant, aged 55, was admitted into the Whitworth Hospital, House of Industry, in 1834, under the care of the late Dr. Ferguson, in consequence of his having been afflicted with phthisis. My lamented friend the late Dr. Mayne, at that time resident clinical clerk in the hospital, informed me that, besides the disease of the lungs, J. Byrne had also an affection of the right shoulder-joint, which presented all the characters assigned by Sir A. Cooper to the case of partial luxation of the head of the humerus; and he was kind enough to invite me to examine him.

The patient complained of inability to use his right arm well, in consequence of having for some years had an affection of the right shoulder-joint, in which he had continually a dull boring pain. He could, however, perform, without much inconvenience, all those motions of the arm which did not require it to be raised to the horizontal line; the joint felt to his own sensation somewhat stiff, and he was conscious, under certain movements of the arm, of a sense of something crepitating or crackling in the joint. Upon viewing the shoulder in front it had a wasted appearance;



the acromion process and other eminences around the joint thus became more conspicuous: the head of the humerus seemed to be a little higher than usual, and to have advanced somewhat forwards. The amount of advance was best seen by viewing the joint in profile or laterally. In this aspect a slight elevation, and the increase of the antero-posterior measurement of the joint, became very obvious. When the arm was grasped, and very slight force was used, the humerus could easily be made to descend somewhat, and at the same time to pass a little beneath the outer margin of the coracoid process, and the surgeon could readily sink his thumb into the outer half of the glenoid cavity, into the space which the head of the humerus had abandoned. When, again, the shaft of the humerus was elevated vertically, its superior extremity could be felt to strike against the under surface of the acromion. In a word, while the symptoms were really those of chronic rheumatic arthritis, they resembled those assigned by Sir A. Cooper as the marks of partial luxation of the head of the humerus "*forwards and inwards.*" None of the other articulations were affected; and as to what was really the disease of the shoulder, it did not at first clearly appear. The man's own account was by no means satisfactory; he stated that he was a groom, and having been often thrown from his horse, he attributed the origin of the complaint in his shoulder to some contusion which the joint on one of these occasions had suffered. This patient remained in

the Whitworth Hospital until his death, from phthisis, occurred. Dr. Mayne and I carefully examined the joint, which is still preserved in the Museum of the Richmond School (see Atlas, Plate III., Fig., 2).

POST-MORTEM.—We found the deltoid and other muscles around the joint in a wasted condition, and much paler than those of the opposite shoulder. When the capsular ligament was exposed, it was found to have superiorly much wider and more extensive attachments than natural. Instead of this fibro-synovial sac having its ordinary attachments *all* round to the limited circumference of the glenoid cavity of the scapula, its adhesion to the upper margin of this cavity did not exist, but the superior and outer portions of the capsular ligament (or rather of the fibrous membrane which here represented the capsule) were connected with the margin of the coraco-acromial arch, and thus the space in which the head of the humerus had been permitted to move had been rendered much more extensive than natural.

The capsular ligament was much thickened, and when opened more synovia than usual flowed out. This membrane was lined with cellular flocculi; and several small cartilaginous bodies, rounded, and of the size of ordinary peas, were seen to hang in the interior of the synovial sac, appended by means of fine membranous threads. All those parts which in the normal condition intervene between the superior part of the head of the humerus and the under surface of the coraco-acromial arch were

completely removed. No remnant or trace of the supraspinatus tendon, nor any portion of the capsular ligament to which this tendon is attached, was to be found. The whole of the intra-articular portion of the tendon of the biceps was absent, and the highest point of the remaining portion of the tendon of this muscle was attached to the bicipital groove. It was remarkable that the acromion process and other portions of bone, viz., the outer extremity of the clavicle and coracoid process, had acquired size and density, although their under surfaces were much worn and excavated, where they formed an arch which overhung the humerus. These appearances showed the great degree of friction and pressure from below upwards which these bones had been subjected to, from the head of the humerus having been constantly drawn upwards by muscular action. We also noticed that the *acromion process* was divided into two nearly equal portions by a line of separation passing, as it were, from within outwards (Plate III., Fig. 2, B, E). This might be supposed by some to have been a fracture which never had been united by bone—an opinion, however, which I did not entertain: the two pieces of bone were on a perfect and uniform level, and the edges of the division in the process of bone exhibited no evidence of any ossific deposit, or such appearances as would lead us to infer that a fracture had ever occurred.

The *glenoid cavity* of the scapula was larger than usual, deeper, and more of a circular and cuplike

form. The glenoid ligament and the cartilage of incrustation were removed, exposing a porous articular socket, around the circumference of which several round cartilaginous nodules had been produced, while rounded foreign bodies adhered to the interior of the synovial capsule of the joint.

The head of the humerus was somewhat enlarged; it had lost its rounded globular form, and had acquired an ovoidal shape.

The articular surface had become enlarged, and extended over the superior margin of the greater and lesser tuberosities. Much of the cartilaginous investment of the head of the bone had been removed, and its place supplied by a porcelain-like deposit. The line which circumscribes the junction of the head of the bone to the shaft was studded all round with granular osseous elevations overhanging the imaginary line which has been denominated the anatomical neck of the humerus (see Plate III., Figs. 2 and 3).

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Our knowledge of the anatomical characters of this disease has now arrived at a degree of precision sufficient, we should suppose, to save us henceforth from falling into the error of confounding appearances, the results of chronic rheumatic arthritis of the shoulder, with those which are the consequence of any other disease or accident. Nevertheless, I feel myself called upon here to allude to some cases of "*partial luxation of the shoulder-joint*," which have

been brought forward as the result of accident, but which I consider to be examples of the chronic disease we have now under consideration.

Sir Astley Cooper, in his description of the accident denominated by him "*partial luxation of the shoulder-joint forwards and inwards*" to the coracoid process, gives a case which he considered one of this accident, and relates the symptoms by which it can be recognised in the living; but for its anatomical characters he is obliged to refer to a specimen of an abnormal shoulder-joint accidentally found in a dissecting-room, the history of which was altogether unknown. He observes,—“The only dissection of this accident which I have had an opportunity of seeing was the following, for which I am indebted to Mr. Patey, Surgeon, Dorset-street, who had the subject brought to him for dissection at the anatomical room, St. Thomas’s Hospital.”

The following is Mr. Patey’s account:—

### CASE VII.

“PARTIAL DISLOCATION OF THE HEAD OF THE OS HUMERI.

“The appearances were as follow: the head of the os humeri, on the left side, was placed more forward than is natural, and the arm could be drawn no farther from the side than the half way to an horizontal position.

“DISSECTION.—The tendons of those muscles which are connected with the joints were not torn,

and the capsular ligament was found attached to the coracoid process of the scapula. When this ligament was opened, it was found that the head of the os humeri was situated under the coracoid process, which formed the upper part of the new glenoid cavity; the head of the bone appeared to be thrown on the anterior part of the neck of the scapula, which was hollowed, and formed the lower portion of the glenoid cavity. The natural rounded form of the head of the bone was much altered, it having become irregularly oviform, with its long axis from above downwards; a small portion of the original glenoid cavity remained, but this was rendered irregular on its surface by the deposition of cartilage. There were also many particles of cartilaginous matter upon the head of the os humeri, and upon the hollow of the new cavity in the cervix scapulæ, which received the head of the bone. At the upper and back part of the joint there was a large piece of the cartilage, which hung loosely into the cavity, being connected with the synovial membrane, at the upper part, only by two or three small membranous bands. The long head of the biceps muscle *seemed to have been ruptured* near to its origin at the upper part of the glenoid cavity; for at this part the tendon was very small, and had the appearance of being a new formation."

The account of the foregoing dissection (which is illustrated by an engraving in Sir A. Cooper's work on Fractures and Dislocations), and copied into all even the latest editions, should not, in my opinion,

be considered in any other light than as an excellent account of the anatomical appearances to be found in those who have had chronic rheumatic arthritis of the shoulder-joint; for I consider that these appearances were not the result of an accidental luxation, but the true effects of this slow chronic disease.\* If Sir A. Cooper had known anything of

\* Professor Smith, in the memoir already alluded to, when specially commenting on this case brought into notice by Sir Astley Cooper, observes, that it is familiarly known to the profession, and generally quoted by surgical writers; but adds:—

“I may, however, remark, that it is much more extensively known as an instance of what it is not, than as an example of what it really is. It is this case which is always adduced in support of their doctrine by those who maintain the possibility of the occurrence of such an accident as partial luxation of the head of the humerus upon the outer side of the coracoid process.

“Many years have elapsed since the publication of the great work of Sir Astley Cooper, and numerous and valuable are the memoirs and essays that have, since that time, appeared upon the injuries of the shoulder-joint; but in almost every one of these treatises, whenever mention has been made of this specimen found accidentally in the dissecting room, and of the previous history of which all are ignorant), it has been referred to as an undoubted example of the effects of external injury, and as affording satisfactory confirmation of an opinion, the correctness of which is highly improbable—namely, that it is possible for the smooth and lubricated surface of the globular head of the humerus to rest permanently upon the margin of the glenoid cavity. And the real nature of the case recorded by Sir Astley Cooper, and its true pathology, have been, upon several occasions, clearly demonstrated, and brought prominently before the profession by Mr. Adams—as, for instance, in his observations upon the subject made to the British Association in 1836 (see *Athenæum*, September 10th, 1836), in his memoir upon the ‘Abnormal

the history of the case during life, we might hesitate to call in question the opinion of so eminent an authority on such a subject; but, as the only grounds he possessed for forming any opinion were derived from the mere anatomical appearances observed in the shoulder-joint of the subject in the dissecting-room, on this account I conceive that every one who studies the report of this dissection, accompanied as it is by an engraving, is at liberty to draw his own conclusion as to what was the real nature of the case. To me it seems quite clear that the appearances observed in the examination of the case referred to by Sir A. Cooper were exactly those most frequently found to be the result of chronic rheumatic arthritis, as it affects the shoulder-joint: the new form assumed by the head of the humerus; the fact of the cartilage having been removed, and its place supplied by an ivory enamel; the piece of cartilage which hung loosely into the cavity, being connected with the synovial membrane at the upper part only by two or three small membranous bands; the attachment of the capsular ligament to the coracoid process,—all these circum-

Condition of the Shoulder-Joint,' published in 1849 (Todd's Cyclopaedia, vol. iv.), and in his numerous communications made to the Pathological Society of Dublin, and recorded in the volumes of both Series of this Journal. But when an erroneous opinion, pronounced by an eminent and justly distinguished author, once becomes generally diffused, it frequently happens that years must elapse before it is overthrown, and truth established in its place."—  
PROFESSOR SMITH, *loc. cit.*



stances, related in the above-mentioned case, strongly remind us of the characteristic traces of the disease which we have denominated chronic rheumatic arthritis, as we have so often met with them. Add to this the observation that the intra-articular portion of the long tendon of the biceps muscle did not exist, or is presumed to have been *ruptured* at its origin: in all these details we find a very complete account of the anatomy of the shoulder-joint which had been the seat of chronic rheumatic arthritis.

On the other hand, such appearances afford no evidence whatever that an accidental luxation was the cause of them. Certain it is, that appearances exactly resembling those described as existing in Sir A. Cooper's specimen have been met with in cases in which their cause could not be attributed to accident, because no injury had been received; while in others it was needless to refer to accident, inasmuch as the morbid action had similarly affected *both shoulder-joints*; so that by the dissection of such cases I am convinced that disease, not accident, was the source of the morbid appearances. I have had an accurate copy made of the engraving which Sir A. Cooper has published of what he has called the anatomy of partial luxation of the humerus (Plate III., Fig. 1), and alongside of it I have placed another of a shoulder-joint taken from the dead body of an hospital patient (Byrne), who had been long affected with chronic rheumatic arthritis, and for

some time under observation in hospital\* (see Plate III., Fig. 2); and it appears to me that all who carefully read the account of the dissection of the two cases, and compare the two engravings, must admit that whatever circumstances influenced the production of the morbid appearances in the one were identical with those which produced them in the other.

Sir A. Cooper, in my opinion, somewhat *gratuitously* supposes that his specimen was the much sought-for example of the anatomy of the accident called partial luxation. I say *gratuitously*, because the previous history of the case he alludes to was unknown, and the accident was only *supposed* to have occurred.

In the hospital case I have adduced (J. Byrne) and illustrated by engraving, Plate III., Fig. 2, the history was known, and has been preserved, with the account of the post-mortem appearances which the examination of the shoulder-joint presented.

At the meeting of the British Association at Bristol, in September, 1836, I gave to the Medical Section an account of this chronic rheumatic disease as it engages most of the joints.† When speaking of its effects on the shoulder, I alluded to this case published by Sir A. Cooper, and then demonstrated, as I thought, to the satisfaction of the meeting, that the specimen of this chronic rheumatic disease which I laid before them for inspection (Atlas, Plate III., Fig. 2), corresponded exactly to the appearances found in the case of partial luxation of

\* See case of J. Byrne, page 114. † See Athenæum, *loc. cit.*

the humerus, supposed to have arisen from accident, delineated in Sir A. Cooper's work\* (Atlas, Plate III., Fig. 1). The opinions I then expressed have since been amply confirmed by experience.

In the "Museum Anatomicum" of G. Sandifort (1827), we find delineated the bones of a shoulder-joint, which present all the characters of chronic



Fig. 6.

SANDIFORT'S CASE.—Partial dislocation upwards, *supposed* to have been a dislocation from accident.

rheumatic arthritis with partial displacement upwards of the head of the humerus (Fig. 6). Sandi-

\* Plate XXI. of Sir A. Cooper's great work on Dislocations.

fort, also, I feel certain, has fallen into an error in coming to the conclusion that this specimen of the bones of the shoulder-joint constituted an example of partial luxation *from accident*, "luxatio ossis humeri ab injuriâ externâ." On the contrary, I would look upon this case also as an example of chronic rheumatic arthritis of the shoulder, the head of the humerus having been partially displaced upwards, as it very commonly is, as the result of this disease.

#### CASE VIII.

The subject of Sandifort's case was a robust man. The head of the humerus having been "driven upwards" between the coracoid process and the acromion, a new articular surface was produced partly on the upper narrow part of the glenoid cavity, and partly on the root of the coracoid process. This new articular surface was in parts porous, and in other parts much polished, and ivory-like ("partim porosa, sed cæterum valde polita ac quasi eburnea"), and had been in habitual contact with the head of the humerus. The latter was much enlarged, and the measure of its circumference round the corona of the head was much increased by the addition of a hard, everted margin, "margine revoluto calloso."

The wearing away of the upper part of the great tuberosity, the eburnation of the summit of the humerus where it came in contact with the concavity of the acromion—even the abnormal contact of the head of the humerus with the under surface

of the *acromial extremity of the clavicle*, a peculiarity we have already observed upon—are all noticed in this specimen thus:—"Caput ossis humeri, amplitudine auctum margine revoluto calloso, in superficie articulari offert eandem præternaturalem glabritiem ac duritiem, dum in vertice ubi tuberculum majus occurrit, superficiem exhibit partim glaberrimam, partim inæquabilem, rugosam, quæ juxta summum humerum movebatur; triturationem etiam locum habuisse inter marginem inferiorem claviculæ et verticem capitis humeri manifeste apparet. *Subluxatio in superiora ergo hic locum habuit.*"\* Here we find the description of the bones unaccompanied with any account of the anatomical characters of the other structures of the joints; nor is there any proof adduced that any accident had occurred to produce the appearance noticed; we may, therefore, we think, conclude that the history of the case was unknown. When we compare Sandifort's description of the above case, accompanied as it is with an engraving, with the account given in the preceding pages of the dissection of other cases of chronic rheumatic arthritis as it affects the structures of the shoulder-joint, I think we may safely conclude that this case, adduced by Sandifort as an example of partial luxation of the head of the humerus from external injury, must be considered as presenting in the bones described the anatomical characters of chronic rheumatic arthritis, as it very commonly affects the bones of the shoulder-joint.

\* *Museum Anatomicum*, G. Sandifort, Tab. CLI. 2, 3, vol. IV.

In the London Medical Gazette, vol. xiv., Mr. J. Gregory Smith (of Leeds) has inserted a paper, entitled "The Pathological Appearances in Seven Cases of Injury of the Shoulder-Joint." The specimens were met with in the dissecting room. Their history could not be ascertained.

That these appearances were really the result of injury or accident cannot be by any means proved; while, on the other hand, the description of the joints will be found on close examination to present the ordinary anatomical signs of chronic rheumatic arthritis, as seen in each of the articular textures.

Some time after the appearance of this paper, Mr. Edwin Canton, of London, in an essay on chronic rheumatic arthritis of the shoulder, did me the favour of alluding to my early opinions upon this matter. He says:—

"Mr. Adams, in writing to me on the subject of the effects of chronic rheumatic arthritis of the shoulder having been frequently mistaken for the effects of accident, remarks, 'There is no joint which has been the subject of more mistakes relative to this disease than the shoulder. Almost all the cases published have been supposed to have been those of partial dislocation (from accident), the history of the case being in ninety-nine out of an hundred unknown.'"

Mr. Canton, entertaining a similar opinion to that which I had so repeatedly expressed, wrote to Mr. J. Gregory Smith. "Being desirous," he says, "of ascertaining from Mr. Smith, whether from

subsequent experience he had found reason to alter his opinion regarding the origin of the morbid phenomena, I wrote to that gentleman on the subject, and have to acknowledge his prompt attention to my letter, and the frankness of his reply. He writes :—

“‘I was in the first instance disposed to view those appearances as purely the result of injury; but the frequency of their occurrence, and the similarity, to a greater or less extent, of the apparent mischief, induced me afterwards to come to a different conclusion, and to view them rather as the destructive results of long-continued chronic inflammation of the fibrous tissues.’”\*

This matured opinion expressed by so experienced an anatomist, as to the nature of the specimens he had himself adduced, concurring, as it does, with the judgment formed as to them by those who have *specially* directed their attention to the subject, may, in my opinion, be considered as conclusive that these appearances described by Mr. J. Gregory Smith were not produced by injury, but that they were the ordinary results of chronic rheumatic arthritis of the shoulder; and that henceforth we may avail ourselves of them as valuable illustrations of the anatomical characters of this disease.

Without following *seriatim* the description given of each of these specimens adduced, let us in a synoptical manner consider the morbid changes which were noticed to have taken place in each of

\* Notes on the Morbid Anatomy of Chronic Rheumatic Arthritis. By Edwin Canton, F. R. C. S. Also, Medical Gazette, 1848.

the articular textures mentioned—namely, the fibro-synovial, the tendinous, and in the osseous structures.

1. The capsular ligament in most of these specimens was thickened and hypertrophied; it was more capacious than natural, allowing of the head of the humerus being placed beneath the coracoid process; in many of the cases a large opening existed in the capsular ligament at its upper part, through which the subdeltoid bursa communicated freely with the general cavity of the shoulder-joint. Other morbid changes were also noticed, such as the deposition of pieces of bone in the capsular ligament close to the margin of the glenoid cavity, as if a piece had been fractured off; and in the interior of the synovial capsule a fibro-ligamentous substance was noticed to extend across the cavity of the joint.

2. As to the state of the *tendons* in these seven specimens, we find that those of the capsular muscles were detached from the tubercles of the humerus. In all the specimens the long tendons of the biceps were found to have been in an abnormal condition. Five of these tendons had the *appearance* of having been ruptured. As to their intra-articular portion they were either totally or partially absorbed; and their extra-articular portion was adherent outside to the edges of the bicipital groove.

In one subject, the long tendon of the biceps, in the right and left shoulder-joints, was symmetrically displaced internally to the head of the bone, and one of these tendons presented an unravelled appearance



3. As to the *bones*, we recognise appearances described with which we are quite familiar, as being those of the ordinary characters of chronic rheumatic arthritis. We find that in many points of contact of the articular surfaces a process of eburnation had taken place, while osseous growths were connected with the tubercles of the humerus and within the margin of the glenoid cavity.

The head of the humerus was found to present a larger articular surface of bone than usual, and the upper margin of the tubercles had become included in it; an ivory-like deposit coated the tubercles, as well as the under concave surface of the acromion.

There was noticed in one individual the detachment of the extremity of the acromion process from the spine of the scapula on both sides.

Thus, then, the singular lesion, consisting in the symmetrical dislocation inwards of the tendon of the biceps in both shoulder-joints of the same individual, and the not less remarkable organic change, namely, the detachment of the acromion process from the spine of the scapula, being also symmetrical, existing in the right and left shoulders of the same subject—all these facts place it beyond a doubt, that accidental injuries never could have given rise to these symmetrical lesions. These, on the contrary, exhibit to us nothing but phenomena abundantly proved to belong to the ordinary anatomical characters of chronic rheumatic arthritis.

I might add to these cases of chronic rheumatic arthritis of the shoulder, with partial displacement

upwards of the humerus, here adduced, many similar examples which have been published, and gratuitously assumed as specimens of the immediate effects of accident: but in the present state of our knowledge this seems scarcely necessary.

The cases already brought forward, and still to be adduced in this Chapter, should, in my opinion, be deemed sufficient, more particularly as Professor Smith, in the memoir already alluded to, and to which I would refer, has, in his critical analysis of some recently reported cases of the above description, done ample justice to this part of our subject.

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The condition of the bones of the shoulder-joint discovered on making the post-mortem examination in cases where the head of the humerus had been partially dislocated upwards under the influence of this disease, seems now to be very well known; but the anatomy of the soft parts in these cases has been too frequently overlooked.

In the post-mortem examination of advanced cases of this disease of the shoulder-joint which I have witnessed, in which there *had been partial luxation upwards*, when the deltoid muscle has been cut through, the head of the humerus has been generally found either in absolute contact with the under surface of this muscle, having passed through the upper part of the capsular ligament, or it has been separated from it merely by the subdeltoid bursa, and has

in these advanced cases of partial displacement upwards been found to have the characteristic appearances it presents under the influence of the disease called chronic rheumatic arthritis. The intra-articular portion of the tendon of the biceps is removed, and all those structures which in the normal state intervene between the summit of the head of the humerus and the under surface of the coraco-acromial arch are absorbed. The superior portion of the capsular ligament is usually found perforated, so that the under surface of the coraco-acromial vault comes into contact with the head of the humerus, and is converted into a supplementary socket for it.

The explanation of the circumstance of the superior part of the capsular ligament having been found thus perforated, leaving a large circular opening through which the head of the humerus can pass, appears to be, that this bone is elevated by the active exertion of the deltoid and other muscles; these are excited into action by the irritation which has commenced in the chronic affection of the articular textures having been communicated to these muscles, which consequently maintain the bone pressed up against the under surface of the acromion. From this, as well as other causes, the head of the bone acquires altogether a new form; its summit becomes expanded, and at the same time smoothed by the constant effect of use and attrition; the anatomical neck of the humerus is encroached upon, and gradually the whole summit, including

the great and lesser tuberosities, becomes articular, these latter eminences being, as it were, ground down, and covered with a porcellaneous deposit; and, moreover, as the upper portion of the circular groove, called the anatomical neck of the humerus, which usually gives attachment to the capsular ligament, has been removed, the connexion of this ligament to the bone must be destroyed, and a large opening of necessity left, through which the head of the humerus can pass (see Atlas, Plate x., Fig. 5).

The loss of the long tendon of the biceps muscle in these cases will, no doubt, facilitate the partial displacement upwards; but we must agree with Professor Smith that the view that such a lesion is absolutely necessary to such an effect cannot any longer be maintained in opposition to a case brought forward by him before the Pathological Society. In this case the head of the humerus was partially displaced upwards, and indeed bore evidence of having been long in habitual contact with the under surface of the acromion process. Yet the tendon of the biceps was in its place, and both it and the capsular ligament in this instance maintained their continuity, the loss of which has been heretofore referred to, as the lesion permitting of the displacement upwards of the humerus.

## CASE IX.

Dr. Hamilton Labatt, when Demonstrator of Anatomy at the College of Surgeons, communicated to the profession a case of chronic rheumatic arthritis of the shoulder, with dislocation upwards, which illustrates well the condition of the bones and soft parts when this disease has been of long standing. He has named the case "an excellent specimen of that chronic disease of the shoulder-joint which old people are liable to; as also an example of partial luxation upwards, the result of that disease."\*

The history of this case, as of almost all of the same kind published, was unknown. The subject was a female, aged 60, brought into the College of Surgeons for dissection. The muscular system was well developed; the common integuments had been removed when Dr. Labatt was called to witness the dissection, and the deltoid muscle was cut across and thrown back, when the attention of the dissector was attracted by the head of the humerus, which was exposed, and firmly supported against the under surface of the acromion process, by the lips of a vertical rent in the capsular ligament (which was otherwise healthy) firmly girding the anatomical neck of the humerus. The articular cartilage of the head of the humerus had been univer-

\* *Vide* London Medical Gazette, 1838, vol. xxii., p. 22; also Catalogue, College of Surgeons, Ireland, vol. ii., p. 396.

sally eroded; the head was increased in size by the addition of an osseous margin, which overhung the anatomical neck of the bone. Several cartilaginous bodies connected to the surrounding tissues projected into the cavity of the joint. The larger were pedunculated and pendulous, whilst the smaller were attached by broad surfaces. The articular part of the tendon of the biceps had disappeared. The capsular ligament was thickened, and the aperture, already mentioned, which existed in the upper part, was sufficiently capacious to allow the head of the bone, under certain circumstances, to pass with facility from its natural situation upwards, and to come in contact with the under surface of the acromion process.

The coraco-acromial articulation of the same side, as well as several other articulations in this subject, exhibited unquestionable traces of having been affected with the same disease.

Although the history of Dr. Labatt's case was unknown, the appearances which the head of the humerus presented were sufficiently characteristic to clearly designate the true nature of the affection. Independently of the condition alluded to of the coraco-clavicular and other articulations, there were many concurring circumstances to be noticed, which sufficiently proved that in the above case the shoulder had been long affected by chronic rheumatic arthritis, a disease with which he was well acquainted; and that this, and not accident, was the source of the partial luxation upwards which existed.

## CASE X.

In April, 1840, Dr. Robert Smith laid before the Surgical Society of Dublin an account of the post-mortem examination he had made of an aged female, who died of an internal organic disease in the House of Industry. She had been long affected with a partial displacement upwards of the right humerus, which was the result of chronic rheumatic disease. He presented a cast of the upper part of the body, taken after death, showing the degree of elevation of the summit of the humerus on the affected side; and also exhibited a preparation of the shoulder-joint to the meeting.

"It may be seen," he said, "from the cast, that in this case there was a remarkable contrast in the appearance the two shoulders presented: on one side the head of the humerus was placed far above the level of the coracoid and acromion processes. Many persons," he added, "in viewing the cast and accompanying preparation, might consider the specimen as one of some unusual form of congenital malformation, or the result of accident, but the abnormal appearances were clearly the result of that peculiar affection of the joints of which so many specimens had been elsewhere brought forward by the President in the Chair, Mr. Adams, and which disease he has denominated chronic rheumatic arthritis." Dr. Smith added, "that his chief reason in bringing forward the case was, that it presented

some peculiarities he had not observed in other specimens of the same disease as it affects the shoulder-joint. He had often before noticed the elevation of the head of the bone as a symptom of this affection, but had never seen the elevation to the same degree it had amounted to in this case. The head of the humerus was displaced upwards, even to a point above the level of the clavicle and acromion process. The capsular ligament was very much attenuated, but dilated, and as thin as if constituted solely of synovial membrane; superiorly this capsule was altogether deficient; here a large aperture was found, which permitted the head of the humerus to pass upwards, as already mentioned. The tendon of the biceps was perfect, but was thrown off *the head of the bone* inwards. The cartilage of the head of the bone was abraded in several places, and osseous depositions had been formed in the vicinity of the bicipital groove, and around the margin of the articular surface of the head of the humerus, as is usually the case in specimens of chronic rheumatic disease. The preparation, Mr. Smith repeated, showed a large deficiency in the upper part of the capsular ligament—a fact not observed by him until he had seen Dr. Labatt's specimen, and even then he was at first disposed to attribute the deficiency to some injury received in removing the parts. He had, therefore, taken the greatest care in removing the preparation just exhibited to the Society, and had found that on dividing the deltoid muscle he had cut at once into



the cavity of the joint. It may be remarked, that in this case the acromion process had been much reduced in thickness; its under surface was excavated, and denuded of all periosteal covering. This process was divided into two portions, as if a fracture had traversed the original line of the junction of the epiphysis with the rest of the process; half an inch in extent of the bone was thus separated from the rest, and seemed retained merely by a ligamentous connexion. The coraco-clavicular and triangular ligaments were relaxed, and in the dead body the shoulder-joint presented in this case a remarkable degree of laxity and mobility. Dr. Smith thought the great peculiarity of the case consisted in the circumstance, that the long tendon of the biceps was not, as it usually is in cases of this chronic disease, absorbed, but was in a state of perfect integrity, and thrown off the head of the humerus and placed inwardly."

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Having proceeded so far with the account of the displacement upwards that the head of the humerus undergoes, as the result of chronic rheumatic arthritis, I may, perhaps, be excused if I merely repeat here what I have already written in another work,\* on the displacement of the tendon of the

\* London Cyclopædia of Anatomy and Physiology; Abnormal Shoulder-Joint: vol. III., page 594.

biceps, and partial dislocation upwards of the head of the humerus :—

“Questions here naturally arise, can the tendon of the biceps be dislocated from the groove by accidental violence? and, if so, shall the consequent dislocation of the head of the humerus be in the direction upwards, exactly as it was in the preceding case, which was evidently an example of the displacement of the tendon from disease?”

Mr. John Soden, Junior, of Bath, brought before the Medico-Chirurgical Society of London a case of partial dislocation of the head of the humerus upwards, with displacement inwards of the long tendon of the biceps; he accompanied it with remarks, the objects of which were to prove, that the tendon of the biceps may be dislocated by accidental violence, and that dislocation upwards of the head of the humerus must follow as an immediate consequence. This case has been published in the Transactions of the Society for the year 1841, and is reported as follows :—

Joseph Cooper, aged 59 years, was admitted into the Bath United Hospital, November 9, 1839, on account of a compound fracture of the skull. His death, six months after the accident, afforded an opportunity of examining the injury of the right shoulder, the symptoms of which had been always involved in great obscurity, and which occurred in the following manner :—

In the month of May, 1839, the deceased (six months before his death) was engaged in nailing

down a carpet, when, on rising suddenly from his occupation, his feet slipped, and he fell backwards on the floor. In order to break the force of the fall, he involuntarily placed his arm behind him, and by so doing received the whole weight of the body upon his right elbow; that joint, the only one struck, received no injury, for the shock was instantly transmitted to the shoulder, and there the whole effects of the accident were sustained. Acute pain was immediately experienced, and the man supposed he had suffered either a fracture or a dislocation; but, finding that *he could raise the arm over his head*, he felt reassured, and endeavoured to resume his work. The pain, however, compelled him to desist, and he went home. "When I saw him," says Mr. Soden, "on the following morning, the joint was greatly swollen, tender to the touch, and painful on very slight motion. There was then no possibility of his placing his arm over his head, as he had done immediately after the accident. Mr. Soden satisfied himself that there was neither fracture nor dislocation of the bones; and, not suspecting the existence of a more specific injury than a severe sprain, set down the case as such, and avoided the unnecessary pain of further examination. Unusually active means were necessary to subdue the inflammation, and at the end of three weeks, though the swelling was much reduced, the tenderness in the front of the joint, and pain on certain motions of the limb, were scarcely less than the day after the occurrence of the accident.

“ On comparing the joint with its fellow, now that the swelling had subsided, a marked difference was observable between their respective outlines: the injured shoulder was evidently out of drawing, but without presenting any glaring deformity. When the man stood erect, with his arms dependent, the distinction was very manifest, but difficult to define. There was a slight flattening on the outer and posterior part of the joint, and the head of the bone looked, as it were, drawn up higher in the glenoid cavity than it should be. Examination verified the appearance in two ways: first, on moving the limb, with one hand placed on the shoulder, a crepitating sensation was experienced under the fingers, simulating a fracture, but in reality caused by the friction of the head of the humerus against the under surface of the acromion; secondly, on attempting abduction, it was found that the arm could not be raised beyond a very acute angle with the body, from the upper edge of the greater tubercle coming in contact with that of the acromion, and thus forming an obstacle to all further progress. The head of the bone was also unduly prominent in front, almost to the amount of a partial dislocation. For all useful purposes the arm was powerless. The pain caused by the action of the biceps was acute, extending through the whole course of the muscle, but felt chiefly at its extremities. When the joint was at rest, the pain was referred to the space in front between the coracoid process and

head of the humerus, which spot was marked by extreme tenderness and some puffy swelling.

"The patient being of a *rheumatic habit*, inflammatory action of that character was soon established in the joint, so that the peculiar symptoms of the injury were marked by those of general articular inflammation, which added greatly to the man's suffering, and to the difficulty of diagnosis.

"**POST-MORTEM.**—On examining the joint, the accident was found to have been a dislocation of the long head of the biceps from its groove, unaccompanied by any other injury. The tendon was entire, and lay enclosed in its sheath on the lesser tubercle of the humerus; the capsule was but slightly *ruptured*; the joint exhibited extensive traces of inflammation; the synovial membrane was vascular, and coated with lymph; recent adhesions were stretched between different parts of its surface, and ulceration had commenced on the cartilage covering the humerus, where it came in contact with the under surface of the acromion; the capsule was thickened and adherent, and in time probably ankylosis of the joint would have taken place."\*

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In this case, it is true that the tendon of the biceps was found dislocated; but are the appearances noticed during life, and found on examination after death, capable of any other interpretation than that

\* Medico-Chirurgical Transactions, 1841.

given to them by Mr. Soden? Upon such a matter I feel I ought to speak with diffidence, because this case differs from almost every one of partial luxation yet published, in this circumstance, that its history was known before the post-mortem examination of the joint was instituted. However, I must confess that I do not by any means feel convinced that the lesion of partial displacement upwards of the head of the humerus as the immediate result of accident has been proved by Mr. Soden.

If we analyze the symptoms the patient reports himself to have observed immediately after the accident, we find that he at first supposed he had suffered either a fracture or a dislocation; but, finding that "*he could raise the arm over his head,*" he felt reassured, and endeavoured to resume his work. It would appear to me that, if the tendon of the biceps were accidentally dislocated, the patient would not have been able immediately after the accident to raise his arm over his head; but the circumstance here noticed, on the other hand, seems quite reconcileable with Mr. Soden's first impression, that there was in this instance no other injury than a severe sprain of the joint. The symptoms under which the patient subsequently laboured were just those of that inflammatory nature which might be expected to have occurred in any ordinary case of so severe a sprain as we may suppose the shoulder-joint to have suffered in this instance. The appearances the joint presented externally, when the disease became sub-acute or chronic—namely, the

flattening of the outer and posterior part of the joint, and the appearance of the head of the bone, which had been drawn *up higher* in the glenoid cavity; the *crepitating* sensation caused by the friction of the head of the humerus against the under surface of the acromion (which could scarcely have existed without having been preceded by disease); the pain felt in the whole course of the biceps muscle; the difficulty experienced in abduction of the elbow from the side; the prominence of the head of the bone in front almost to the "amount of a partial dislocation"—all these symptoms I have repeatedly noticed to belong to the affection of the shoulder-joint which I have called *chronic rheumatic arthritis*, and they have been present in patients who have had this disease in both shoulder-joints at the same time, and in whom they could not by any means be stated to be referrible to accident. Finally, before we dismiss the part of our analysis of this case which refers to the symptoms, we must not omit to allude to the author's own observation:—"The patient being of a *rheumatic habit*, inflammatory action of that character was soon established in the joint; so that the peculiar symptoms of the injury were masked by those of general articular inflammation, which added greatly to the man's suffering and to the difficulty of diagnosis."

If the patient were of a rheumatic habit, or predisposed to this disease in his joints, it may be readily conceived that any injury this man, aged 59, might receive in the shoulder-joint, should have

been calculated to set in action the disease called chronic rheumatic arthritis.

As to the anatomical examination of the joint, it will be recollected that the disease had not been long established; and, therefore, that the more striking results of chronic rheumatic disease should be found was not to be expected. Those which were noticed, however, were just such as might be supposed to represent the anatomical characters of chronic rheumatic arthritis of the shoulder in an early stage.\*

I had written thus much on the subject of partial dislocation of the head of the humerus upwards, with displacement inwards of the long tendon of the

\* Besides the notice of this case already mentioned, contained in the Medico-Chirurgical Transactions, 1841, it has been subsequently (1842) set forth by Mr. B. Cooper, in his edition of Sir A. Cooper's work on Fractures, &c.

In the Third Volume of the Cyclopædia of Anatomy (Abnormal Shoulder, 1849), I have endeavoured to prove, by the reasons above stated, that Mr. Soden's view was erroneous, and that the appearances he has described were really the result of chronic rheumatic arthritis.

Professor Smith, who, as Curator (indeed I may say Fabricator) of the Richmond Hospital Museum, has had so much experience, and ought to be considered good authority on this subject, takes a view of the case similar to mine; for in the Memoir already alluded to, he says: "I cannot pass on without expressing my regret, that in several of the systematic treatises upon surgery that have even *recently* appeared, in which Mr. Soden's case has been mentioned, no allusion whatever has been made to the elaborate analysis of it in the Cyclopædia of Anatomy, in which I consider will be found '*a complete refutation of Mr. Soden's view of his own case.*'"



biceps, when, on the 12th of August, 1848, an opportunity occurred to me of examining, anatomically, both shoulder-joints of a patient who had died in the North Union Workhouse on the day previously. He had been for eight years under Dr. Kirkpatrick's observation, and was one of the severest sufferers I had ever known from chronic rheumatic arthritis in all his joints.

It was very remarkable that, on examining anatomically both shoulder-joints in this case, we discovered a similar partial displacement upwards of the head of the humerus, with dislocation inwards of the tendons of the biceps *in both* shoulder-joints, and each of these dislocations exactly resembled that found in *one* shoulder-joint by Mr. Soden in his case.

The following is the history of this case, with an account of the post-mortem appearances the shoulder-joints presented:—

#### CASE XI.

Charles Mailly, aged 48, had been a carter in the country, and was remarkable for his strength and activity; he was addicted to drinking ardent spirits to excess, and it was stated of him, that he frequently lay whole nights in the open air in a state of insensibility from drunkenness. To these bad habits he attributed the origin of his disease, which at last disabled him from earning his bread. He was admitted into the North Union Poorhouse in

1840. When I visited him there in August, 1847, I learned that he had been confined to his bed for the last five years, that he could not walk, nor even stand upright. His hip-joints, knees, and elbow-joints, were semiflexed; and, although this flexion could be increased, the limbs could not be extended. His neck was stiff, and he found much difficulty in bending it forward; his wrists also were rigid, and his fingers and toes presented the characteristic nodosity and distortion which belong to chronic rheumatic disease. His shoulders had an emaciated appearance, but the bones of the articulation seemed much enlarged, and the heads of both humeri were somewhat elevated above the level of the coracoid process. The shoulders presented the usual signs of this disease; but he did not complain so much of them as he did of his hips, elbow, and knee-joints, which had been so much longer and more severely affected.

The integuments over the affected joints were sore to the touch, and even the weight of the bed-clothes, he thought, caused him to suffer; he complained that the changes in the atmosphere always increased his sufferings, and that he endured more during frosty weather than at any other time. The usual crackling sound, or articular crepitus, was noticed whenever any of the joints were moved.

The man's countenance and manner betrayed the delicacy of his health, as well as the great discomfort of his condition. His bowels were occasionally obstinate. The urinary secretion was natural.

In consequence of the stiff condition of the cervical vertebræ already mentioned, and the rigidity and useless state of the joints of the upper extremities, he was unable to feed himself, and became entirely dependent on others. He was released from this miserable state of suffering by an attack of diarrhœa, which carried him off at the time above specified.

POST-MORTEM EXAMINATION.—The hip-joints, elbows, and knees, were semiflexed, and could not be extended, the degree of flexion could be somewhat increased when any of the joints were moved, and the characteristic articular crepitus, or crackling, was equally elicited now as during life.

*Right shoulder-joint.*—On dissecting off the integuments from this articulation, the deltoid muscle was pale, and formed a thin, attenuated layer of muscular fibres covering the joint. When this muscle was detached, the subdeltoid bursa was exposed, and proved to be of a yellowish colour, and had a fibrous appearance, somewhat like to a capsular ligament; when this bursa was cut into by an incision parallel to the margin of the acromion, its cavity was observed to be more capacious than usual.

The *capsular ligament* arose in the ordinary manner from the circumference of the glenoid cavity, and passed from this origin to be inserted into the humerus. Though sufficiently strong, it seemed much less extensive, and shorter than usual, and had become attached posteriorly to the head of

the humerus before it had reached its ordinary place of insertion into its anatomical neck. The capsule, by its attachment to the head of the bone, circumscribed an oval articular surface comparatively small. When the cavity of this ligament was cut into posteriorly (where the tendon of the infraspinatus, &c., covered it), adhesions were found to have existed between the interior of the capsule and the posterior part of the head of the humerus. When the capsule was opened anteriorly, where the tendinous insertion of the subscapularis covered it, it was now seen more evidently than before that the head of the humerus had been placed habitually above the level of the coracoid process (Fig. 7, B), and the highest part of the glenoid cavity.

The intra-articular portion of the tendon of the biceps (Fig. 7, D) was now seen to lie entirely to the inside of the head of the humerus; indeed, such was its position, that it might be rather said that the humerus was displaced outwardly, and elevated above the level of the course of the tendon of the biceps, than that the latter was dislocated inwards; a semicircular groove in the cartilage marked the course of the tendon of this muscle as it arched across the inner side of the head of the humerus to join the bicipital groove much below its ordinary point of entrance into it. The tendon was somewhat diminished in thickness, except at the point where it was becoming extra-articular, and here a rounded callosity existed, and it became adherent to the edges of the bicipital groove. The shortened

condition of the capsular ligament, as well as the adhesions between the inner surface of this capsule and the head of the bone, maintained it in the abnormal state of elevation described.



FIG. 7.

C. MAILEY'S CASE.—Right shoulder-joint : partial displacement upwards of the head of the humerus, with displacement inwards of the tendon of the biceps. The left was similarly affected.

The *head* of the humerus was enlarged and altered from its normal figure, particularly above, in the neighbourhood of the great tuberosity, which bulged out much externally. The portion of the head which was situated above the course of the tendon of the biceps was divested of all cartilaginous covering, was of a yellowish colour, and remarkably hard, but as yet no ivory enamel

had been formed, because as yet no process of attrition had commenced, nor had bone come into contact with bone. The under surface of the neck of the bone was furnished with a vast number of the synovial fimbriæ (Fig. 7, 1). These, when first examined in the recent state, were of a very red colour. The humerus seemed as if it had remained habitually in contact with the glenoid cavity, rotated inwards, and in this position these synovial fimbriæ lay in contact with the inferior and broadest part of the glenoid cavity; and it was very remarkable that wherever these red synovial fimbriæ had been in exact apposition with the cartilage of incrustation of the glenoid cavity, precisely in the extent of the contact, the cartilage had been removed, proving that these vascular fimbriæ acted as absorbing villous surfaces. The glenoid cavity presented but little to be noticed, except a porous appearance (where its cartilaginous investment had been removed by the absorbing villi), and the commencing state of disintegration of the glenoid ligament. The cartilage which remained on a portion of the head of the humerus, as well as that which still adhered to the surface of the glenoid cavity of the scapula, was rough, and altered from its natural state.

The *acromio-clavicular* articulation of this side seemed enlarged externally, the periosteum appeared thickened. When the articular surfaces were exposed, it was found that their cartilaginous

covering had been removed, and that they were nearly double their normal size.

It is quite plain that the movements of the head of the humerus in the glenoid cavity in this case had been confined to those of a species of semi-rotation only; the adhesions which were found to exist between the head of the humerus and the inner surface of the synovial membrane of the joint, as well as the new and oval form which the head of the humerus had assumed, sufficiently suggested this.

*Left shoulder-joint.*—This articulation in almost every respect was symmetrically affected, as was the right, but particularly as regarded the dislocation of the tendons of the biceps, the existence of fimbriæ, &c., and therefore it does not require a separate description.

It does not appear necessary to enter into any very special details relative to the condition the other articulations were found in; it may be remarked, however, that they presented the general appearances that these structures usually exhibit in cases in which that inveterate constitutional form of chronic rheumatic arthritis exists, which causes the patient to be bedridden for years. For example, as to the lower extremity, "the cartilage of the head of the left femur was partially destroyed. The bone itself was rough, and appeared in a highly vascular condition, but *had no ivory deposit* on the surface; the lining membrane of the acetabulum was also very vascular, and the acetabulum itself

was deepened. The articulating surfaces of the knee and ankle-joints, as well as those of the bones of the foot, particularly the metatarso-phalangeal articulation of the great toe, were all affected similarly to those of the hip already mentioned. The foot remained habitually on its outer edge. The tendon of the extensor communis was shortened, and there was partial dislocation backwards of the first phalanges of the fourth and fifth toes. The superficial and deep tendons of the flexor communis lay internal to the phalanges of these toes, having slipped from the grooves in which in the normal state they are retained.\* The lungs and other viscera were sound. I may mention that, upon looking to the state of the heart and its membranous coverings, we found the pericardium adherent to the heart on all its surfaces. From the state of the membrane covering the heart, we may, I think, feel pretty certain that this individual once had rheumatic fever, and that out of this arose the general chronic disease of all his joints.

So far as the anatomical characters of the disease of the shoulder-joint are concerned, there is a marked similarity in the morbid appearances to be observed in the case adduced by Mr. Soden, and in this of Charles Mailly just related. In Mr. Soden's case accident may have had just so much to do with the displacement of the tendon, that the injury

\*This portion of the notes of this case was taken down by my pupil, Richard C. Todd, now Surgeon, 60th Foot.



became the immediate and exciting cause of the development of a local disease, a predisposition to which had existed in the constitution of the patient. In the case of Maily the disease was the same—that is to say, chronic rheumatic arthritis affecting both shoulder-joints—while Mr. Soden's was a well-marked specimen of the *local* form of the same denomination of disease—affecting, however, only one articulation.

From all, therefore, which has been stated, it would appear to me that hereafter, whenever the tendon of the biceps shall be found displaced internally to the head of the humerus, we should not conclude that the lesion was the immediate effect of accident, but that inquiry should be made whether chronic rheumatic arthritis may not have been its cause.

And, in concluding my observations on this subject, I may here be permitted to state my belief, that as yet there has never been any undoubted case of dislocation of the tendon of the biceps from accident laid before the public.

I regret much that I have not had an opportunity of examining the preparation of the shoulder-joint presented by Mr. Soden to the Museum, King's College, London; but at the time I was writing on this subject, I requested my colleague and former pupil, Dr. M'Dowel, at that time in London, and who was familiar with the many preparations of joints which had been affected with chronic rheumatic arthritis contained in the Richmond Hospital Museum, to

report to me his opinion on the appearances Mr. Soden's specimen presented ; and he wrote to say, "that from the partial examination he could make of the preparation, he had only to remark, that the head of the humerus is considerably enlarged, and that the long tendon of the biceps, which has been dislocated internally, is in a state of atrophy." In those two last-mentioned additional circumstances, as well as in those previously noticed, the preparation resembles those of the shoulder-joints of Charles Mailly.\*

That the long tendon of the biceps should, under the influence of changes which the structures of the joint may have undergone from this disease, be thus thrown off the round head of the humerus, over which it arches, should not appear extraordinary. We have known similar displacements of tendons under analogous circumstances ; for example, we may generally observe that the effect of chronic rheumatic arthritis of long standing on the extensor tendons of the fingers and toes is, to cause their tendons to be displaced off the lower extremities of the metacarpal and metatarsal bones.

In one case of dissection, which I have given elsewhere, the superficial and deep tendons of the flexor communis were found internal to the pha-

\* These I have presented to the Museum of the Royal College of Surgeons in Dublin, and they have been preserved by Mr. Carte, the Curator. A statement of the case was laid before a meeting of the Pathological Society, during the Winter Session 1848-49, and the specimens were exhibited.

langes of the toes, these tendons having slipped from the grooves in which, in the normal state, they were retained, and analogous to these. The ligament of the patella and the patella itself are sometimes thrown over the outer condyle of the femur, when the knee-joint has been the seat of chronic rheumatic arthritis.

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Although I have as yet said but little of any displacement of the head of the humerus, as a consequence of this disease, except in the direction upwards, yet I would now call attention to facts, to prove that the head of this bone, under the influence of the changes induced by it in the structures of the shoulder-joint, may suffer partial displacement in other directions, viz.: directly *inwards*, under the coracoid process; and, lastly, directly *downwards*, on the axillary margin of the scapula. We shall first treat of partial displacement of the head of the humerus inwards, the result of chronic rheumatic arthritis.

I may observe that in the Museum of the College of Surgeons, Dublin, we find a specimen presented by Professor Hargrave, of *partial luxation inwards*, which he considers to have been the result of *accident*.

The accidental origin of the affection, however, cannot be proved, as the history of the case is unknown; and the specimen presents so many of the appearances which result from chronic rheumatic

arthritis, combined with the partial luxation, that I am of opinion that Professor Hargrave's specimen cannot be considered to have had an accidental origin, but that all the appearances it presents are the consequence of long-established chronic rheumatic arthritis. I shall here give an abstract of Professor Hargrave's case, referring for a fuller account to the *Edinburgh Medical Journal*.

“ The capsular ligament presented a perfect state of integrity along the superior and posterior parts of the joints; it was dense and strong; extending from the acromion process downwards and forwards towards the humerus. When the capsule was opened on its internal aspect, the head of the humerus was seen to be in part external to the joints, and was divided into two unequal portions by a deep groove extending for the entire length of its head in a perpendicular direction. Of these portions the internal and larger one passed a small distance beyond the corresponding edge of the glenoid cavity into the subscapular fossa, while the posterior and smaller one remained in the cavity, occupying its internal surface. The groove now mentioned fitted on the inner edge of the cavity, which did not present its usual well-defined border, but was rounded off, so as to present a thick lip, from the constant pressure and frequent motion of the humerus upon it. The head of the humerus in its superior aspect was in close apposition with the coracoid process, and had altered in a remarkable degree its form, which, in place of being beaked and

pointed, was much *expanded, flattened, and slightly hollowed*. When the articulation was first opened the tendon of the long head of the biceps could *not be seen*; but on more particular examination it was found to have been *ruptured*, the portion connected with the muscle being intimately attached to the bicipital groove of the humerus, while the portion belonging to the glenoid cavity was much diminished in size, and presented a mere rudimental character in the capsular cavity.\*

When we carefully examine this specimen, we notice that it presents many of the general anatomical characters of chronic rheumatic arthritis, these appearances being of course modified as to the external shape of the surfaces by the special peculiarity of the partial displacement which had in this case occurred. The head of the humerus was much enlarged and misshapen; it was found that a large portion of the new articular cavity for it divided into two surfaces, articulated with both the new and the old glenoid cavity. The effects of friction during the movements which took place between the bifid head of the humerus and the double articular cavity, which corresponded to it, were such, that perfect and complete eburnation of parts of the contiguous surfaces took place. This last circumstance could not be said in itself to

\* See Catalogue of the Museum of the Royal College of Surgeons, Dublin, vol. II., p. 397; Edinburgh Medical and Surgical Journal for October, 1837.

amount to proof that chronic disease, rather than accident, had caused the partial luxation. But, in addition to the ivory-like enamel, we find also that bony vegetations, or granular nodules of new bone, surround the outline of the new articular surface formed for the head of the humerus, and that small foreign bodies, like sesamoid bones, are seen bordering the edge of the articular cavity posteriorly. All these minor circumstances remind us of the anatomical characters we have found in examining cases of chronic rheumatic arthritis of the shoulder. The coracoid process, we are informed, had altered in a remarkable degree its form, which had become expanded, flattened, and slightly hollowed; in a word, it became articular, as we have before\* found it to be, as the result of chronic rheumatic arthritis. The glenoid ligament was absent, and when the joint was opened, the long head of the biceps could not be seen; "it was found to have been ruptured," &c.

I have already made the remark, that when the shoulder-joint is the seat of chronic rheumatic arthritis, the neighbouring acromio-clavicular articulation is frequently affected with this disease. Now, in carefully examining Professor Hargrave's specimen we shall find that not only do the anatomical characters which belong to chronic rheumatic arthritis exist in this shoulder-joint, but also, that the acromio-clavicular articulation in the same spe-

\* See Atlas, Plate II.

cimen is enlarged externally ; and that on examining it internally, it presents undoubted traces of this chronic rheumatic arthritis. Upon the other hand, I feel convinced that this specimen produced by Professor Hargrave as an example of a case of partial luxation inwards, the result of accident, does not really afford any proof that external injury was the cause of this partial luxation. In thus differing from Professor Hargrave, I would make the same remarks which I have already made in allusion to Sir A. Cooper's case, p. 121.

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Partial displacement of the head of the humerus directly *downwards* has been observed to be the result of chronic rheumatic arthritis of long standing ; but, after much diligent inquiry in museums and books, I can find but two well marked specimens of this morbid change. The most remarkable of these specimens is a left scapulo-humeral articulation, which is contained in the Museum of the College of Surgeons, Dublin ; the preparation formed part of the collection presented by the late Dr. Kirby to the College. The head of the left humerus in this specimen is greatly enlarged, and had descended much beneath its ordinary situation ; and here a new glenoid cavity of a proportionate size had been formed on the axillary border of the scapula to receive it. The lower part of the old glenoid cavity was par-

tially occupied by the enlarged head of the humerus, but the new addition to the cavity extends downwards for the space of an inch and a half below its ordinary situation. The new glenoid cavity is enamelled upon its surface, and enlarged on its posterior margin by several irregular-shaped bones of new formation. The capsular ligament in this case has been partly ossified.\* (Atlas, Plate IX., Fig. 7).

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If we look over the engravings in Sandifort's "Museum Anatomicum," we shall find a specimen of partial displacement of the head of the *humerus downwards*, which, I have no doubt, was the result of chronic rheumatic arthritis. The writer of the Catalogue considers the specimen to have been the result of accident, and has appended a history to the case, giving an account of somewhat equivocal symptoms. Whether these symptoms, such as extensive effusion into the cavity of the joint, crepitus felt on the motions of the bones on each other, were really the result of accident or disease, there is no proof adduced. When we carefully compare the engraving with what we have elsewhere seen of other specimens of this disease, we must, I think, come to the conclusion, that this example adduced by Sandifort must be considered as the result of

\* See Catalogue of the Museum of the College of Surgeons, Dublin, pp. 406, 905, &c.



chronic rheumatic arthritis of long standing, with partial displacement of the altered head of the *humerus downwards* (Fig. 8). The acromion process (*c*) in this case had suffered the usual solution



FIG. 8.

Right scapula, with a portion of the clavicle, viewed from behind. The head of the humerus had been partially displaced downwards, the result, most probably, of chronic rheumatic arthritis. *a*, Glenoid cavity. *b*, Portion of bone of new formation. *c*, Extremity of the acromion, and line of division between it and the rest of the process and the spine of the scapula. *d*, Anterior extremity of the coracoid process. *e*, Clavicle adhering to the extremity of the detached acromion. (*c*), Which "omnem motum clavicularum sequatur."—SANDIFORT.

of continuity in the original line of junction of its epiphysis. There were also the additional portions of bone of new formation (Fig. 8, *b*) attached to the interior of the capsular ligament, and the enlargement and implication of the acromio-clavicular joint in the same morbid action with that of the shoulder. All these usual accompaniments of chro-

nic rheumatic arthritis of the shoulder were observed in this case, and, together with the new osseous margin beneath the ordinary level of the glenoid cavity (which are represented in G. Sandifort's engraving as large as nature\*), are in a reduced form delineated here (Fig. 8).

The history of chronic rheumatic arthritis of the shoulder, notwithstanding the lengthened consideration I have here given to it, would be still very incomplete if I did not advert to some cases, which, though they may be rare, yet prove to us the possibility of this disease being found in combination with lesions of the joint of a totally different nature. For example, two of the most remarkable specimens of the effects of chronic rheumatic arthritis on the bones of both shoulder-joints I noticed, when examining the preparations of diseased bones contained in the Museum of Bartholomew's Hospital. The account of them given in the Catalogue is as follows (pp. 108-132):

“The bones of both shoulder-joints of an adult: in each joint there has been ulceration, or such absorption as occurs in chronic rheumatism of the articular surface of the head of the humerus and of the glenoid cavity. The heads of the humeri are flattened and enlarged by growths of bone around their borders, and the glenoid cavities enlarged in a corresponding degree, and deepened, extend back-

\* Sandifort, Museum Anatomicum, Vol. iv. Tab. 24, Fig. 2.

wards and inwards to the basis of the spines of the scapulæ. The articular surfaces, thus enlarged, are mutually adapted, and are hardened, perforated, and in some parts polished and ivory-like. The changes of structure are symmetrical, except in that the articular surfaces of the right shoulder-joint are more extensively polished than those of the left."

When I first examined this preparation in 1846, finding that the dislocation and other lesions mentioned existed in both shoulders, I at once concluded that accident could not have been the source of these remarkable abnormal appearances; and, as I had already noticed displacements of the head of the humerus in other directions, as the result of chronic rheumatic arthritis, I did not then see any more rational means of accounting for these displacements and other organic changes, than by referring them to such a source. However, subsequent observations and reflections, and a case adduced by Professor Smith, have convinced me that these two late specimens are examples of the case of congenital luxation of the head of the os humeri on the dorsum of the scapula, and that these same articulations ultimately became affected by chronic rheumatic arthritis. The luxations were congenital, but the hardening and ivory-like polish of the surfaces, and the growths of bone around the borders of the heads of the humeri are the effects of chronic rheumatic disease, which had supervened, perhaps, late in life, and were superadded to the congenital lesions of the articular structures.

Professor Smith has lately published a case in which the twofold combination of congenital malformation and chronic rheumatic arthritis existed in both shoulder-joints. Although the history of this case was unknown, it can be easily deduced from the appearances that dislocation backwards of the heads of the ossa humeri existed at birth, and that late in life chronic rheumatic arthritis had been superadded. To quote the words of the author:\*

“It will be sufficient to give a detailed account of one of the articulations, so closely did they resemble each other, both in external configuration and in anatomical characters. Upon the right side the head of the humerus, placed much farther back than natural, and elevated so as to be in contact with the under surface of the acromion process, formed upon the dorsal region of the scapula a conspicuous tumour, which moved with the shaft of the bone. The acromion and coracoid processes, more especially the latter, were unusually prominent. The shoulder was flattened anteriorly, and the axis of the humerus passed somewhat inwards. On removing the deltoid muscle, and laying open the capsular ligament, it was found that no articular surface existed in the normal situation of the glenoid cavity, but upon the external or dorsal aspect

\* Professor Smith has not only the merit of having first made the Profession acquainted with the case of congenital dislocation of the head of the humerus backwards, but also that of first proving, as he has done by the case I am now adducing, that the congenital lesion may have grafted on it the chronic disease we are here describing.

of the neck of the scapula there had been formed a glenoid-shaped concave surface for the reception of the head of the humerus; it measured two inches and a quarter in its vertical, and one inch and



Fig. 9.

Right scapula, soft parts removed. Congenital luxation of the head of the humerus backwards had existed, and chronic rheumatic arthritis had been superadded. The acromion process presents the usual line of division (A) across it, like to a fracture. The two lesions, consisting in congenital malformation and superadded disease, existed in both of the shoulder-joints in this remarkable case.—See "Dublin Quarterly Journal of Medical Science," February, 1853.

three-quarters in its transverse diameter; totally destitute of cartilage, it was covered by a texture as hard and dense as enamel, and as smooth as *polished ivory*.

The acromion process, about an inch from its

anterior extremity, was divided into two portions; the detached fragment rested upon the summit of the great tuberosity, and the great solution of continuity corresponded to the sulcus which separates the tubercle from the head of the humerus. There was no deposition of bone along the line of separation, nor was there any displacement of the detached portion, which was closely connected with the remainder of the process by the fibrous tissues derived from the muscles which are here attached.

“A glenoid ligament, much broader than natural, surrounded the greater part of its margin; it adhered intimately to the capsular ligament, but had become in several places detached from the circumference of the socket.

“The tendon of the biceps muscle arose from the summit of the articular cavity; there was no interruption of continuity in any part of its course, but its intra-articular portion was remarkably short; it passed from its origin almost at once to the bicipital groove. At the point where it arose, however, from the glenoid cavity, its texture was unravelled, and its fibres separated from one another.

“The head of the humerus had completely lost the globular form which it possesses in the normal state; it was flattened from within outwards, and its axis appeared continuous with that of the shaft of the bone; its superior border was prolonged downwards, so as to conceal a portion of the ana-

tomical neck of the humerus, between which and the elongated margin of the head there existed a deep sulcus or fissure, which was occupied by vascular productions from the synovial membrane. The articular surface, the outline of which had become quadrilateral, was fully an inch broader than the socket in which it moves, and was smooth and polished to the same extent as the glenoid cavity. The lesser tuberosity was enlarged, and had become articular, and irregular osseous growths surrounded the head of the bone.

“The tendons of the capsular muscles were perfect, with the exception of that of the subscapularis, the attachment of which to the rough and scabrous lesser tubercle had to a certain extent disappeared. The capsular ligament was somewhat thicker than natural.

“Upon the left side the condition of the articulation was similar to that just described as existing upon the right. In the form, situation, extent, and polish of the glenoid cavity; in the broad and partially detached glenoid ligament; in the unravelled condition of the tendon of the biceps at its origin; in the enlargement, flattening, and polish of the head of the humerus; its elevation to the acromion process; the nodulated state of its circumference; its prolongation downwards—in all these respects there existed a perfect similarity between the two articulations. There was also upon both sides an osseous growth from the margins of the bicipital grooves, by which their depth was increased.

“ Upon the left side, however, the acromion process was perfect, but the surface for articulation with the clavicle was enlarged. Upon this side, also, osseous depositions had taken place in the capsular ligament, near its attachment to the inner margin of the glenoid cavity.” Professor Smith adds :—

“ It must, I think, be obvious to those acquainted with the external signs and anatomical characters of congenital luxations of the shoulder backwards, and who are also familiar with the morbid appearances which chronic rheumatic arthritis presents when established in this articulation, that in these remarkable specimens two distinct classes of phenomena existed : the one manifestly indicating original malformation ; the other as clearly denoting the superaddition of a disease of a peculiar character. To the former belong the absence of any vestige of a glenoid cavity ever having existed in the situation which it naturally occupies ; the accurate resemblance to one another of the abnormal sockets in position, shape, and dimensions ; the shortness of the intra-articular portions of the bicipital tendons ; and the existence of glenoid ligaments. These phenomena indicate, in my opinion, that the deformities originated neither in disease nor accident ; and when I compare them with those observed in the case of double congenital subacromial luxation, elsewhere described by me,\* I feel more strongly

\* Fractures in the Vicinity of Joints, p. 206.



convinced that in the rare and remarkable case just described the malformations were also congenital.

“Among the appearances which demonstrate that chronic arthritis had long existed in each of these malformed joints, are to be placed the removal of the articular cartilages; the enamelling of the osseous surfaces thus exposed; the bony growths around the bases of the heads of the humeri; the deposition of bone in the capsule; the unravelling of the fibres of the bicipital tendons; the growth of the numerous vascular bunches of synovial fimbriæ; and the solution of continuity in the acromion process.

“In confirmation of this view of the case it may be mentioned, that in the body of the person in whom these specimens were found all the fingers and toes were webbed, and that one of the hip-joints presented a well-marked example of chronic rheumatic arthritis, evidenced by the disappearance of the ligamentum teres; the removal of the articular cartilage; the existence of an ivory-like deposit; and, finally, by shortening of the neck of the femur, and an alteration in the angle which it naturally forms with the shaft.”\*

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We need not, in my opinion, be much surprised

\* Dublin Quarterly Journal of Medical Science, February, 1853.

to find that chronic disease should become engrafted on the articular structures of shoulder-joints in which congenital malformations existed, because we can readily conceive that, if any latent disposition to chronic rheumatic arthritis existed in the constitution, the exercise of a joint which had been imperfectly formed by nature would be very likely to give rise to this disease, which is often the result of over-work, even in well-formed articulations.

Analogous to the circumstances of this peculiar disease being superadded to an originally malformed shoulder-joint, is the case which has been witnessed of chronic rheumatic arthritis arising in the structures of a shoulder-joint which had been dislocated, and left unreduced. For example, the late Dr. Power, then Professor of Anatomy to the Royal College of Surgeons, laid before the Pathological, and also before the Surgical Society, on the 17th of December, 1853, a case of unreduced dislocation of the head of the humerus into the axilla,\* in which case, on dissection, besides the ordinary anatomical characters which belong to such a lesion, there were found superadded those that specially characterize the disease called chronic rheumatic arthritis.

In this case it is presumed that the chronic diseased condition of the joint *succeeded* to the luxation; but experience has taught us to be alive to

\* See Medical Press, January 18, 1854.

the possibility of a patient while labouring under this chronic disease in the shoulder-joint becoming the subject of an accidental luxation of the articulation : that in one case at least this has occurred, we find strongly, and, in my opinion, successfully argued by Professor Smith, although the eminent surgeon, Mr. Hilton, who published the case in question, had not taken the same view of the matter. Mr. Hilton considered the case one of luxation of the right humerus into the axilla, with fracture, while Professor Smith argued the case to be an example of dislocation and fracture occurring in a joint previously the seat of chronic rheumatic arthritis.\*

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In concluding the account of chronic rheumatic arthritis of the hip and shoulder, it may prove not uninteresting here to compare the anatomical characters of this disease, as they present themselves in the articular textures of the hip, with those which the dissection of a shoulder-joint that had been affected with the same disease exhibit. For example, first, one of the most remarkable lesions noticed as the result of this chronic disease having existed in the hip-joint is the loss of "the round ligament" which normally connects the head of the

\* For Mr. Hilton's case, see the 5th volume of Guy's Hospital Reports; and, for Mr. Smith's analysis of it, see Dublin Quarterly Journal, 1853, p. 15.

femur to the interior of the acetabulum. This ligament, we know, has its representative in the shoulder-joint in the long tendon of the biceps; and this tendon, when the latter joint has been affected by this disease, is very generally removed, just as the round ligament is when the hip-joint has been the seat of this peculiar affection.

Secondly. Whether it be the hip or shoulder-joint which has been thus diseased, it will be found that the capsular ligament belonging to the joint is hypertrophied, and that highly developed synovial fimbriæ exist in the interior of the synovial sacs equally in both articulations.

Thirdly. There is an enlargement and eburnation of the articular surfaces in both cases, as well as an exuberant growth of bone surrounding the corona of the head of the femur in the one, and the circumference of the articular surface of the head of the humerus in the other: these similar *morbid* appearances, as exhibited by the post-mortem examinations made of the hip and shoulder-joints, which had been affected by chronic rheumatic arthritis, show an identity as to the nature of the morbid actions they have been subjected to.\*

And as to a correspondence in the *symptoms* of this disease, as it affects both articulations, we may make similar observations. For instance, the peculiar nature of the pain; the stiffness of the joint when first moved in the morning, and the subse-

\* Atlas, Plate xi., Figs. 1 and 2.

quent improvement under exercise during the course of the day ; the sub-inflammatory condition of the joint, which impairs, but does not altogether impede its use, and which I have never known to proceed, in either articulation, to suppuration or to ankylosis. In a word, all these are the special symptoms and anatomical characters of one and the same disease, as it affects in a similar manner the hip and shoulder-joints, respectively.

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The history of Chronic Rheumatic Arthritis of the Elbow and Knee—the Wrist and Ankle—as well as of all the smaller articulations of the region of the hand and foot, shall next, successively, engage our attention, and be followed by an account of this disease as it manifests itself in the temporo-maxillary articulations, in those of the clavicle, and, finally, in those of the spinal column.

## CHAPTER III.

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### THE DISEASE IN THE ELBOW.

WHEN the elbow-joint is the seat of this peculiar affection, it is seldom found to be a local disease. The opposite elbow, as well as many of the other articulations of the patient, are usually symmetrically implicated.

#### SYMPTOMS.

The first symptoms the patient complains of are usually confounded with those of ordinary rheumatism ; soon the joint becomes somewhat hot and swollen ; its ordinary movements, whether of flexion, extension, or rotation, become restricted within very narrow limits ; and, when we attempt to communicate any of these motions, a crepitation of rubbing surfaces is perceived.

In the early stages of this disease the synovial sac of the elbow-joint is much distended with fluid ; but after a time this redundant quantity diminishes, and at length there would seem to be even a deficiency of the normal secretion. In many of these

cases of chronic disease of this articulation, I have observed that, around the joint, bursæ, which had not normally existed before, become developed during the progress of the disease, and into the subcutaneous bursa, which exists normally behind the olecranon process, an effusion of an inordinate quantity of synovial fluid takes place, and foreign bodies can sometimes be felt within it.

#### DIAGNOSIS AND PROGNOSIS.

The above-mentioned signs and symptoms, when present in any case, furnish us with the means of diagnosing this disease from that of articular caries of the elbow-joint, with which it might possibly be confounded. In the case, however, of articular caries of the elbow-joint, there is very seldom more than one joint of the patient affected, which is swollen, while the limb above and below the articulation is much wasted; there is also constant pain, aggravated by the slightest pressure, against each other, of the bony articular surfaces in cases of articular caries; and hectic fever is an usual attendant. On the contrary, in cases of chronic rheumatic arthritis of the elbow, it is to be noticed that no hectic symptoms are present; the bony articular surfaces can be forcibly pressed against each other, without causing pain to the patient; the opposite elbow, too, is usually affected, and some of the other articulations present the usual characteristic signs of chronic rheumatic arthritis.

The restoration to perfect use of the elbow-joint is not to be expected in either of the cases above mentioned. The disease, no doubt, in both may perhaps, by judicious treatment, be arrested; but the prognosis to be given in each case, respectively, ought to be very different. For example, in the case of articular caries, suppuration of the joint is not uncommon, and excision of the diseased bones, or even amputation, may sometimes be called for. In the case of chronic rheumatic arthritis of the elbow, the prognosis may be less gloomy. The complaint in the joint is no doubt invariably tedious in its course, and difficult to remedy, taxing much the patience of the sufferer; but I have never known any severe surgical operation indicated nor required in the treatment of chronic rheumatic arthritis of the elbow; the disease, after arriving at a certain stage, often then becomes stationary, and will be found in a condition which impedes, but does not altogether prevent, the use of the limb.

#### ANATOMICAL CHARACTERS.

The abnormal appearances produced by this disease as it affects the elbow-joint, discovered by our anatomical investigations, are various. I have observed the bones forming this joint in elderly persons, who have long suffered under the constitutional form of this disease, remarkably light and porous, and in a state of atrophy. In other cases, on the contrary, where the disease had



assumed the local form, I have found them enlarged and hypertrophied (see Atlas, Plate iv., Fig. 4.) The cartilage of incrustation, in either case, is always removed; in some the porous or cellular structure of the bones is exposed, and in others it is covered with a porcelain-like enamel. The trochlea of the humerus and the corresponding surface of the great sigmoid cavity of the ulna, are marked by parallel ridges and grooves in the line of flexion and extension, and the edges of the articular surfaces are generally studded all round with bony nodules and vegetations.

The superior extremity of the ulna I have found in some of these cases greatly hypertrophied, and having besides attached to the edges of the articular surfaces osseous growths of the class I have denominated *additamentary* bones, analogous to those which we have noticed in other articulations (see Plate ix., Fig. 7, D), affected with chronic rheumatic arthritis.

We have in the Museum of the Richmond Hospital an example of an elbow-joint, which had been affected with chronic rheumatic disease, of the local form, of which a cast having been taken, the bones were subsequently, by dissection and maceration, denuded of all their coverings; these preparations are delineated in Atlas, Plate iv. Figs. 4 and 5. The account of the bones given in the Catalogue is as follows:—"This preparation shows the effects of chronic rheumatic antrhritis of the bones composing the articulation of the elbow. The bones are

very much hypertrophied, and their articulating extremities altered in form and size ; a great number of foreign bodies (some cartilaginous, some bony) existed in the articulation. The synovial membrane was intensely vascular. A number of vascular fimbriæ projected from it into the interior of the joint. The bursæ in the vicinity of the articulation were enlarged."

The sigmoid cavity of the ulna in this remarkable specimen is enormously enlarged ; bony nodules and vegetations surround the edges of the articular cavity. The enlarged olecranon process, being twice its normal size, was found to have been completely severed from the rest of the ulna by a transverse line of division, which ran across the middle of the great sigmoid cavity, yet the portions thus severed (so far as the bone was concerned) were still held in such juxtaposition by the surrounding structures, that it was only on close anatomical examination it was known that a real separation between them existed.

This circumstance reminds me much of the condition the acromion process is frequently found in, when the shoulder-joint has been the seat of this peculiar disease. I may here mention, that I once had an opportunity of seeing, among a collection of diseased bones contained in the Museum of Guy's Hospital, a specimen of an ulna which bore the traces of chronic rheumatic arthritis in its great sigmoid cavity ; and on the front of this last was seen the coronoid process, much hypertrophied, and se-

vered at its root, yet still held in exact juxtaposition with the ulna ; and in my own collection I have preserved a similar specimen.



FIG. 10.

Right ulna, viewed externally, radius removed; A, lesser sigmoid cavity for articulation with radius; B, additamentary bone; C, a sharp point of new bone, which seems to have been added to the olecranon process. The great scaphoid cavity was much larger and more concave from above downwards, and more convex transversely, than natural.

These solutions of continuity between the shaft of the ulna and its processes evidently did not arise from any accidental lesion, such as a fracture. The opposed surfaces of the separated portions of bone, though held close to each other by fibrous structures, presented no sign of any process of bony union having been attempted ; no ossific deposits, nor osseous growths, existed, which should have been the case if any fracture had occurred.

The cause of the solution of continuity in these cases between the shaft of the ulna and its processes, above mentioned, becomes a question well worthy of inquiry, but one to which, in the present

state of our knowledge, I imagine no satisfactory answer can be given; we must only suppose that the separation occurs in obedience to the same law which under analogous circumstances of disease we find effecting a complete division into two portions of the acromion process—a lesion we have already dwelt on in the preceding chapter. Hereafter, when describing the varied anatomical characters of chronic rheumatic arthritis of the wrist-joint, I shall have to refer to analogous organic changes observed in the detachment of the styloid process from the lower extremity of the ulna—singular lesions, which we have observed to be the result of this peculiar disease. It is very remarkable that in almost all of these examples the detached processes have been observed to have been much hypertrophied.

The appearances which the *radio-humeral portion* of this articulation presents under the influence of this disease also deserve consideration here. For example in many cases the head of the radius becomes greatly enlarged, and assumes quite a globular form, while the anterior and outer part of the lower extremity of the humerus will have its capitulum or convex head not merely rendered plane; but here the humerus will be found to have become even excavated so as to receive the globular-shaped head of the radius, and to accommodate itself to the abnormal form this last has acquired from disease (Plate iv., Fig. 3, c). In many cases where the radius had become thus enlarged, and of a globular

form, I have found the cartilage removed altogether, and its place occupied by an ivory-like enamel. In two examples I have seen a depression or dimple in this orbicular-shaped head of the radius, similar to what naturally exists in the head of the femur ; and in these two cases, strange to relate, a distinct bundle of ligamentous fibres, analogous to the round ligament of the femur, passed from the dimple or depression alluded to, connecting this head of the radius to the back part of the sigmoid cavity of the ulna (see Atlas, Plate IV., Fig. 3).

In other instances the head of the radius is otherwise altered from its natural form ; the superior articular extremity of this bone has been found excavated from side to side ; its outline not being circular but ovoidal, accurately representing, on a small scale, the glenoid cavity of the scapula (see Atlas, Plate IV., Figs. 1 and 2).

I may here remark, that I had a patient, aged 60, under my care in the House of Industry, who had for many years suffered under the severest form of chronic rheumatic arthritis in all his articulations. I had noted in particular the condition of the right elbow-joint: the forearm remained habitually in a middle state between pronation and supination ; rotation was impossible ; and the motions of flexion and extension were very limited, attended with crepitation, and this exercise caused the patient to suffer much pain. This man died of a complaint unconnected with this chronic disease ; and upon making a post-mortem examination of the right elbow-joint,

we observed the glenoid form of the head of the radius and condition of the bones above described (see Plate IV., Fig. 2). The loss of the circular outline of the head of the radius fully accounted for what we had in this case previously noted, viz.: that to remove the hand from the medium state between pronation and supination in which it habitually remained, or to communicate any movement of rotation to it, was impracticable. The glenoid-shaped surface of the head of this bone in this case admitted only of limited flexion and extension in the radio-humeral joint.

I possess a specimen, the result of this disease (Atlas, Plate IV., Fig. 1), in which the head and upper part of the shaft of the radius are much hypertrophied; the superior articular surface presents an oval form, its long axis being nearly two inches in extent. This bone must have habitually remained in a middle state between pronation and supination, and the direction of the *minute ridges and grooves*, noticed on the eburnated articular surface, sufficiently indicate that the movements of the fore-arm on the arm in this individual must have been limited to those of flexion and extension, the fore-arm being all the while in a middle state between pronation and supination.

Besides this alteration in the form of the head of the radius under the influence of this disease into the globular and ovoidal figures, I have also to observe, that I have met with a specimen in which the head of this bone was greatly enlarged, while

at the same time its superior articular extremity presented a surface nearly plane, with a *quadrilateral* outline. The articular surface corresponding to that of the humerus was covered with a well-marked porcellaneous deposit, remarkably white, and highly polished.

The globular and ovoidal forms which the head of this bone, under the above-mentioned circumstances, assumes, with its enlargement and porcellanoid deposit, are well seen in preparations contained in our Museum (Plate IV.); and the very remarkable specimen of the quadrilateral shape with enlargement of the head of the bone, &c., &c., which I have also alluded to, will be found in the ample collection of diseased bones contained in the Sandifort Museum at Leyden.\*

#### FOREIGN BODIES IN THE ELBOW-JOINT.

In most of the cases I have examined I have discovered what are called "foreign bodies, or pendulous bodies" in the cavity of the joint. These I have found of all sizes, from that of a pea to that of a walnut. Some were seen hanging into the cavity of the articulation, suspended by white slender membranous threads, which seemed to be productions from the synovial sac; and some were loose in the joint; while, as to their structure, some were cartilaginous, and others bony. The

\* See also Index, case of M'Garry.

The restoration to perfect use of the elbow-joint is not to be expected in either of the cases above mentioned. The disease, no doubt, in both may perhaps, by judicious treatment, be arrested; but the prognosis to be given in each case, respectively, ought to be very different. For example, in the case of articular caries, suppuration of the joint is not uncommon, and excision of the diseased bones, or even amputation, may sometimes be called for. In the case of chronic rheumatic arthritis of the elbow, the prognosis may be less gloomy. The complaint in the joint is no doubt invariably tedious in its course, and difficult to remedy, taxing much the patience of the sufferer; but I have never known any severe surgical operation indicated nor required in the treatment of chronic rheumatic arthritis of the elbow; the disease, after arriving at a certain stage, often then becomes stationary, and will be found in a condition which impedes, but does not altogether prevent, the use of the limb.

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The superior extremity of the ulna I have found in some of these cases greatly hypertrophied, and having besides attached to the edges of the articular surfaces osseous growths of the class I have denominated *additamentary* bones, analogous to those which we have noticed in other articulations (see Plate ix., Fig. 7, D), affected with chronic rheumatic arthritis.

We have in the Museum of the Richmond Hospital an example of an elbow-joint, which had been affected with chronic rheumatic disease, of the local form, of which a cast having been taken, the bones were subsequently, by dissection and maceration, denuded of all their coverings; these preparations are delineated in Atlas, Plate iv. Figs. 4 and 5. The account of the bones given in the Catalogue is as follows:—"This preparation shows the effects of chronic rheumatic arthritis of the bones composing the articulation of the elbow. The bones are

very much hypertrophied, and their articulating extremities altered in form and size ; a great number of foreign bodies (some cartilaginous, some bony) existed in the articulation. The synovial membrane was intensely vascular. A number of vascular fimbriæ projected from it into the interior of the joint. The bursæ in the vicinity of the articulation were enlarged."

The sigmoid cavity of the ulna in this remarkable specimen is enormously enlarged ; bony nodules and vegetations surround the edges of the articular cavity. The enlarged olecranon process, being twice its normal size, was found to have been completely severed from the rest of the ulna by a transverse line of division, which ran across the middle of the great sigmoid cavity, yet the portions thus severed (so far as the bone was concerned) were still held in such juxtaposition by the surrounding structures, that it was only on close anatomical examination it was known that a real separation between them existed.

This circumstance reminds me much of the condition the acromion process is frequently found in, when the shoulder-joint has been the seat of this peculiar disease. I may here mention, that I once had an opportunity of seeing, among a collection of diseased bones contained in the Museum of Guy's Hospital, a specimen of an ulna which bore the traces of chronic rheumatic arthritis in its great sigmoid cavity ; and on the front of this last was seen the coronoid process, much hypertrophied, and se-

vered at its root, yet still held in exact juxtaposition with the ulna ; and in my own collection I have preserved a similar specimen.

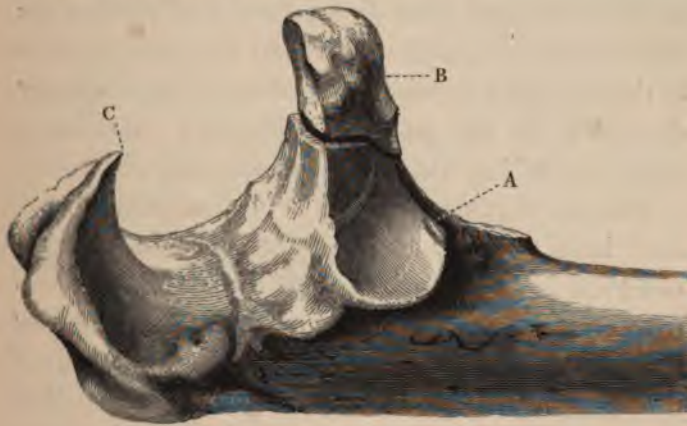


FIG. 10.

Right ulna, viewed externally, radius removed: A, lesser sigmoid cavity for articulation with radius; B, additamentary bone; C, a sharp point of new bone, which seems to have been added to the olecranon process. The great scaphoid cavity was much larger and more concave from above downwards, and more convex transversely, than natural.

These solutions of continuity between the shaft of the ulna and its processes evidently did not arise from any accidental lesion, such as a fracture. The opposed surfaces of the separated portions of bone, though held close to each other by fibrous structures, presented no sign of any process of bony union having been attempted ; no ossific deposits, nor osseous growths, existed, which should have been the case if any fracture had occurred.

The cause of the solution of continuity in these cases between the shaft of the ulna and its processes, above mentioned, becomes a question well worthy of inquiry, but one to which, in the present

state of our knowledge, I imagine no satisfactory answer can be given; we must only suppose that the separation occurs in obedience to the same law which under analogous circumstances of disease we find effecting a complete division into two portions of the acromion process—a lesion we have already dwelt on in the preceding chapter. Hereafter, when describing the varied anatomical characters of chronic rheumatic arthritis of the wrist-joint, I shall have to refer to analogous organic changes observed in the detachment of the styloid process from the lower extremity of the ulna—singular lesions, which we have observed to be the result of this peculiar disease. It is very remarkable that in almost all of these examples the detached processes have been observed to have been much hypertrophied.

The appearances which the *radio-humeral portion* of this articulation presents under the influence of this disease also deserve consideration here. For example in many cases the head of the radius becomes greatly enlarged, and assumes quite a globular form, while the anterior and outer part of the lower extremity of the humerus will have its capitulum or convex head not merely rendered plane; but here the humerus will be found to have become even excavated so as to receive the globular-shaped head of the radius, and to accommodate itself to the abnormal form this last has acquired from disease (Plate iv., Fig. 3, c). In many cases where the radius had become thus enlarged, and of a globular

form, I have found the cartilage removed altogether, and its place occupied by an ivory-like enamel. In two examples I have seen a depression or dimple in this orbicular-shaped head of the radius, similar to what naturally exists in the head of the femur ; and in these two cases, strange to relate, a distinct bundle of ligamentous fibres, analogous to the round ligament of the femur, passed from the dimple or depression alluded to, connecting this head of the radius to the back part of the sigmoid cavity of the ulna (see Atlas, Plate iv., Fig. 3).

In other instances the head of the radius is otherwise altered from its natural form ; the superior articular extremity of this bone has been found excavated from side to side ; its outline not being circular but ovoidal, accurately representing, on a small scale, the glenoid cavity of the scapula (see Atlas, Plate iv., Figs. 1 and 2).

I may here remark, that I had a patient, aged 60, under my care in the House of Industry, who had for many years suffered under the severest form of chronic rheumatic arthritis in all his articulations. I had noted in particular the condition of the right elbow-joint: the forearm remained habitually in a middle state between pronation and supination ; rotation was impossible ; and the motions of flexion and extension were very limited, attended with crepitation, and this exercise caused the patient to suffer much pain. This man died of a complaint unconnected with this chronic disease ; and upon making a post-mortem examination of the right elbow-joint,

we observed the glenoid form of the head of the radius and condition of the bones above described (see Plate IV., Fig. 2). The loss of the circular outline of the head of the radius fully accounted for what we had in this case previously noted, viz.: that to remove the hand from the medium state between pronation and supination in which it habitually remained, or to communicate any movement of rotation to it, was impracticable. The glenoid-shaped surface of the head of this bone in this case admitted only of limited flexion and extension in the radio-humeral joint.

I possess a specimen, the result of this disease (Atlas, Plate IV., Fig. 1), in which the head and upper part of the shaft of the radius are much hypertrophied; the superior articular surface presents an oval form, its long axis being nearly two inches in extent. This bone must have habitually remained in a middle state between pronation and supination, and the direction of the *minute ridges and grooves*, noticed on the eburnated articular surface, sufficiently indicate that the movements of the fore-arm on the arm in this individual must have been limited to those of flexion and extension, the fore-arm being all the while in a middle state between pronation and supination.

Besides this alteration in the form of the head of the radius under the influence of this disease into the globular and ovoidal figures, I have also to observe, that I have met with a specimen in which the head of this bone was greatly enlarged, while

at the same time its superior articular extremity presented a surface nearly plane, with a *quadrilateral* outline. The articular surface corresponding to that of the humerus was covered with a well-marked porcellaneous deposit, remarkably white, and highly polished.

The globular and ovoidal forms which the head of this bone, under the above-mentioned circumstances, assumes, with its enlargement and porcellanoid deposit, are well seen in preparations contained in our Museum (Plate IV.); and the very remarkable specimen of the quadrilateral shape with enlargement of the head of the bone, &c., &c., which I have also alluded to, will be found in the ample collection of diseased bones contained in the Sandifort Museum at Leyden.\*

#### FOREIGN BODIES IN THE ELBOW-JOINT.

In most of the cases I have examined I have discovered what are called "foreign bodies, or pendulous bodies" in the cavity of the joint. These I have found of all sizes, from that of a pea to that of a walnut. Some were seen hanging into the cavity of the articulation, suspended by white slender membranous threads, which seemed to be productions from the synovial sac; and some were loose in the joint; while, as to their structure, some were cartilaginous, and others bony. The

\* See also Index, case of M'Garry.

number of these foreign bodies I have seen in the cavity of the elbow-joint, I confess, has astonished me, amounting in one case to twenty, in another to forty-five (Atlas, Plate v.).

In all these cases there seems to be a very active circulation of blood in the capillary vessels of the bones and other structures of the joint; much of the synovial membrane may be removed with the cartilages, but the synovial folds and fimbriæ which encircle the neck of the radius are found to be in a highly vascular and congested condition.

Lastly, instead of the few scattered fibres external to the synovial sac, which in this joint, when in a normal state, can scarcely be said to resemble even the rudiment of a fibrous capsule, I have found in these morbid specimens the thickness and number of ligamentous fibres so considerable, that the joint seemed to possess almost a complete capsular ligament.

In Cruveilhier's "Pathological Anatomy," Livraison No. 9, Plate VI., Fig. 1, there is a graphic delineation of an elbow, illustrating many of the points here alluded to. He styles the disease "*usure des cartilages articulaires*"—a denomination I have already objected to, because I feel assured that the disease does not confine itself to the cartilages of the joint, but that the articular heads of the bones are also engaged; indeed, in many of our specimens the bones of the elbow-joint are so much enlarged as to resemble, at first sight, the knee-joint; the shafts, also, of the ulna and radius (Atlas, Plate IV.,



Fig. 4, B, C,) are heavier and harder than natural; and their cancellated structure no longer exists, the cells being so densely penetrated with phosphate of lime, that the sections of these bones in several parts present the appearance of ivory.

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## CHAPTER IV.

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### THE DISEASE IN THE KNEE.

THE commencement of this chronic disease in the knee-joint is marked by the usual signs of subacute inflammation of the synovial membrane, such as pain, heat, and swelling. The pain is usually referred to the inner condyle of the femur and tibia, and is not very severe, so that during the early period of the disease the patient can walk much without inconvenience; but from year to year the stiffness and uneasiness felt in the joints gradually increase; while the knees are swollen and enlarged, the muscles of the thigh and leg diminish somewhat in size; still, when examined with the hand, they feel firm. The tendons of the hamstring muscles become tense, and in many cases, particularly if the disease be of the constitutional form, the power of either fully flexing or extending the joints is lost. Indeed, in some instances, the patient becomes, from the gradual increase of the disease, incapable of walking, or even standing without assistance. The knee-joint, from the commencement of the

disease, is noticed to have a strong inclination inwards, and this character or feature becomes the more remarkable when both articulations are symmetrically affected. The bones of the leg are usually rotated on their long axis outwards, so that the foot is everted. Now, if the limb be kept habitually in the semiflexed position (as in those who are bedridden in consequence of this disease), and the tibia be, as above described, rotated outwards, of necessity carrying with it the ligamentum patellæ, it becomes easy to account for the circumstance which, in the advanced stage, is occasionally to be noticed—namely, that the patella may rest on the front of the outer condyle of the femur, or may be even thrown entirely to the outside of the condyle,\* as it is in the ordinary luxation outwards of this bone produced by accident. We can refer to examples in which this displacement outwards of the patella, as the result of chronic rheumatic arthritis occurred in both knee-joints of the same patient.

In the case of Sheridan, the patella of the left knee-joint was dislocated completely outwards, and lay on the external surface of the outer condyle of the femur (woodcut, Fig. 34, c); and in the case of Cassidy, the dislocation of the patella outwards, had occurred in both knee-joints—see cases.

The disease, in its early stage, is manifestly a chronic synovitis, and the effusion which accompa-

\* See case of Mrs. Cassidy; also case of Sheridan, Index.

nies the subinflammatory action gradually increases in quantity.

When the distention of the synovial sac is at its maximum, we occasionally notice, besides the very considerable soft fluctuating tumour in front of the knee-joint, elevating the patella, that there is at the same time a similar fluctuating tumour, about the size of a hen-egg, projecting posteriorly into the popliteal region (Plate IX., Fig. 1, B). This tumour leans towards the inner head of the gastrocnemius; it disappears when the knee is flexed, and becomes more tense and hard when the limb is in the extended position, as when the patient stands erect. I have known many cases of this disease thus affecting the knee-joint, in which the synovial sac of this articulation had been much distended with fluid. In most of these cases the popliteal swelling existed, and in a few instances opportunities were afforded me of ascertaining by dissection that the smaller swelling projecting towards the popliteal space was formed by the over-distention of a normal bursa, which freely communicated with the interior of the larger synovial sac of the joint (see Atlas, Plate IX., Fig 8, A). When the palm of the hand is applied over the patella, in the early stages of the affection, a sensation of a preternatural degree of heat is felt; and when pressure is made on the patella, and a lateral movement across the condyles is communicated to it, a very evident roughness is perceived, either on the articular surface of the patella itself, or the corresponding surface of the trochlea of the

femur, or both; and when the knee-joint is alternately flexed and extended, a characteristic articular crepitus becomes manifest. In the later stages of the disease, the subacute inflammation, with the phenomena which it presents, subsides; the synovial fluid becomes absorbed, and the patella falls back on the trochlea of the femur; the popliteal bursa also disappears, but the grating produced by rubbing surfaces becomes more evident; it is perceived by the patient himself in all his movements, and can even be heard by the bystanders.

If at this period the surgeon make a careful examination of the joint, he will first notice that the patella is *broader* than natural, and crests and ossific depositions can be felt in different points of the femur and tibia.

Besides, he can very frequently detect the existence of foreign bodies in the interior of the joint. Some of these foreign bodies seem superficial, small, and moveable, and give us the idea that they are attached by a pedicle to bone (see Plate VIII., Fig. 2, B). Others are large, and seem situated more deeply within the joint.

I do not think I can give a better idea of the *symptoms* which indicate the existence of "foreign bodies" in the knee-joint, in cases affected with chronic rheumatic arthritis of this articulation, than by quoting some memoranda that I have taken of cases which had been under my observation in the Richmond Hospital: for example, I find, with reference to one case (Ryan), that the patient himself,

on his admission, pointed our attention to a foreign body in his right knee-joint. Sometimes this body was found high up, being situated one inch higher than the patella ; sometimes it was placed internally to the inner edge of this bone ; sometimes it could be felt externally to its outer margin. This body was of a rounded form, about the size of a filbert ; and so smooth was its surface, that it slipped away under the slightest pressure of the fingers from place to place, within the joint ; the patient, in walking, observed it occasionally to interpose itself between portions of the articular surfaces, causing him a momentary uneasiness. He had also pains in the joint of a rheumatic kind.

On referring to another case (Lynch), I find that, "in examining the surface of the joint, our attention was directed to the internal side, where near to the junction of the internal condyles of the tibia and femur, a little rounded body, about the size of a hazel nut, could be seen to elevate the skin, and could be felt through it ; it seemed quite superficial, and could be grasped between the finger and thumb, and to a certain small extent be moved about within the synovial sac ; and the examination of this body gave to Dr. Bradshaw, then our clinical clerk, and myself the perfect assurance, that it was attached by a membranous pedicle to the bone.\*

\* This memorandum was taken on the admission of the patient into Hospital, in March 1837, and the post-mortem examination made in January, 1842, of the knee-joint verified the diagnosis. Atlas PLATE 8, Fig. 2, B.

The history the patient gave us of the foreign body, was, that at an early period of his illness, and a time when he was free from any complaint in the opposite knee, as he was one day running across a field, he suddenly fell down, and when he got up, he felt, for the first time, the small body at the inside of the knee—and that this afterwards often unexpectedly interposed itself between the articular surfaces, and whenever this occurrence took place it caused him instantaneously to fall down.

We may here remark that it is by no means unusual, that after one of these occurrences having taken place, the patient may be confined by a sub-acute attack of Synovitis, requiring rest and local depletion.

#### PROGNOSIS.

As to the prognosis we should form relative to this disease when it affects the knee-joint, we have only to say, that it is an affection which is of such a chronic nature that in some cases it occupies years in its course, and therefore must present many phases of development, and some varieties may be expected to be seen. In the constitutional form, the knee-joint is often somewhat contracted, the degree of flexion of it may be increased, but any attempt to extend it fully, or communicate any movement to the knee, is found to be most painful to the patient, who under such circumstances may in time become quite bedridden, and the patella, as before

mentioned may, under the slow progress of the disease, be dislocated externally on one or both sides. In other cases, however, where only one knee-joint is implicated, the patient, though lame, may be able to walk about for years—complaining more of *weakness* of the joint, than of pain. Such patients are the proper subjects of medical and surgical treatment, chiefly, however, only of a palliative kind; and while, on the one hand, such a patient may be properly permitted to use his limbs, when well supported with suitable appliances, on the other hand, he should be made aware of the circumstance, that in some of these chronic cases it is known that a slow process of disorganization of the fibrous articular textures of the knee-joint may take place, and proceed so far, that all ligamentary ties of the bones to each other may give way, and it follows as a necessary consequence of this, that either partial or complete luxation of the joint shall occur.

Such cases as these last mentioned are sometimes met with, but I feel happy in being able to say that they are exceedingly rare.

#### DIAGNOSIS.

Although this chronic disease of the knee-joint, is accompanied with the ordinary symptoms of a sub-acute arthritis, the constitution of the patient is in many cases but little disturbed by it; the affected limb is at first capable of extension and flexion, the patient can walk without suffering much inconvenience at the time, feeling afterwards



only but a temporary stiffness of the joint ; he does not complain of spasmodic startings of the limb, as those do who suffer under articular caries ; and when the ordinary experiment is tried of percussing the heel, so as suddenly to direct the condyle of the tibia with force against the lower articular surface of the femur, he suffers no pain. Thus we learn, that the affection differs from that wearing disease, ulceration of the cartilages of the knee-joint, which we know sometimes calls for amputation of the limb.

As to the diagnosis between chronic rheumatic arthritis of the knee, and the strumous disease familiarly called *white swelling*, as it affects the knee-joint—in the latter case there is much wasting of the limb above and below the affected joint. The swelling is not well defined, it is elastic to the feel, with a degree of firmness—while in the case of chronic rheumatic arthritis of the knee, during the early stage, when swelling exists, it is soft and fluctuating, and evidently consists in an effusion into the synovial sac of the joint. The soft cellular membrane around the synovial sac and behind the tendon or ligament of the patella does not become infiltrated in the case of chronic rheumatic arthritis as it does in white swelling ; on the contrary, in the case of chronic rheumatic arthritis of the knee, the ligamentum patellæ stands out quite distinctly, and this presents its normal appearance where it is inserted into the tuberosity of the tibia (Atlas, Plate IX., Fig. 1, E).

The peculiar crackling sound elicited on any movement being communicated to the knee-joint—the rising crests and rims of bone which can be felt bordering the edges of the trochlea of the patella, and the *margins* of the femoral condyles—the enlargement and increased breadth of the bones, particularly of the *patella*—all these characters, when found combined in any given case of an affection of the knee, sufficiently point it out as an example of chronic rheumatic arthritis.

#### ANATOMICAL CHARACTERS.

SYNOVIAL MEMBRANE.—When the opportunity is afforded to us of making an anatomical examination of a knee-joint in which this disease had existed in an early stage, we find the synovial sac to be much dilated, somewhat thickened, and to contain an inordinate quantity of synovia. When this is removed, the inner surface of the synovial sac is generally found to be of a highly red colour, and to resemble somewhat an inflamed conjunctiva; the synovial fimbriæ are much developed, and in a state of vascular congestion.

On examining the popliteal tumour, which we have above adverted to, in detailing the symptoms of this disease of the knee, we find it to consist in an enlargement (from distention by the synovial fluid) of the bursa, which normally exists at the point of decussation of the semi-membranous tendon with the tendon of the internal head of the gastrocnemius. This bursa usually communicates

in the normal state with the larger synovial sac of the joint, and by a very small circular aperture; and when, under the influence of this disease, the synovial sac of the knee-joint becomes distended with fluid, this neighbouring popliteal bursa also becomes swollen.

I have had opportunities of examining cases of this kind anatomically; and when I have inspected the interior of some of the over-distended popliteal bursæ above alluded to, I have noticed that this little offset of the general synovial sac of the knee did not form one uniform ovoid cavity, but that it had semi-lunar septa thrown partially across its interior, thus rendering the bursa a small multilocular cavity (see Atlas, Plate IX., Fig. 8, A). In the ordinary course of this disease, the redundant quantity of fluid is absorbed, and the popliteal tumour disappears. I have found, on making the post-mortem examination of one of such cases, the obliterated popliteal bursa to have its walls converted into a small white solid tumour, about the size and shape of an almond.\*

**HYPERTROPHIED SYNOVIAL FIMBRILÆ, PENDULOUS EXCRESCENCES.**—Besides the uniform redness and congestion of the synovial membrane of the knee, as already mentioned, we must not omit to draw attention here to a vascular and hypertrophied condition of the synovial fimbriæ, found to exist in knee-joints which had been affected with chronic

\* See case of P. Donohoe.

rheumatic arthritis. These fimbriæ have not escaped all notice hitherto, but they have not—except by very few—been adverted to as appearances specially belonging to the anatomical signs of the chronic disease we are here considering.

Cruveilhier, in giving an account of the dissection of a knee-joint in which were noticed the appearances we are now familiar with as the ordinary effects of chronic rheumatic arthritis, such, for example, as eburnation of the articular cartilage, &c., adds: There existed also in the interior of this articulation “une multitude des franges synoviales tres developées et rouges.”\*

Other pathologists have alluded to analogous productions from the interior of the synovial membrane of the knee and other joints; and if we carefully analyze, as far as can be done, their observations, I think the morbid productions adverted to will be found to have occurred in individuals who had been during their lifetime affected with chronic rheumatic arthritis.

To prove this last point, however, I feel obliged here to enter somewhat into detail.

Sir Benjamin Brodie, in the *third edition* of his work on the “Diseases of the Joints,” has drawn attention to the fact, that in some rare cases “pendulous excrescences” are produced from the interior surface of the knee-joint; he gives the following account of these cases:

\* Cruveilhier, “Anatomic Pathologique,” Liv. IX., p. 14.

“In the Museum of St. George’s Hospital there is a specimen of a knee-joint, the inner surface of which is lined by a great number of small pendulous excrescences, connected with the synovial membrane, having a smooth external surface, and bearing an apparent resemblance to the *appendices epiploicæ* of the great intestine, though not, like them, containing adipose substance.

“The preparation was purchased at the sale of the late Mr. Heaviside’s anatomical collection,\* and nothing is known of the history of the patient from whom it was taken. We have another somewhat similar specimen; and in the last case there is reason to believe that the excrescences were the result of long-continued *inflammation of the synovial membrane*. A third example of the same disease is in Sir Charles Bell’s Museum, † which was formerly in Great Windmill-street. The late Mr. Shaw informed me, that in this case the joint contained a considerable quantity of whey-like fluid; but he was not able to give me any further information respecting it.”\*

The late Mr. Herbert Mayo† also observes, that “The synovial membrane lining the capsular ligament of the knee-joint has been found covered *with innumerable little processes, something like melon-seeds* in shape and colour, some larger, others smaller, pendulous into the cavity of the joint.” Of this affec-

\* On “Diseases of the joints,” by Sir Benjamin Brodie, p. 280. Third Edition, 1836.

† “Outlines of Pathology,” p. 105. 1836.

tion, he says he has himself met with but one instance.

The case he alluded to, in which the above-mentioned morbid appearance existed, was that of a man between thirty and forty years of age, who had suffered for several years with occasional attacks of what was considered *rheumatic gout in the knee*, that is to say, with pain, swelling, and weakness. After a time these symptoms would get better, but the knee always remained a little enlarged. The patient died of the effects of an inguinal aneurism, and the appearances above described were found on making a post-mortem examination of the knee-joint, in which he had suffered the occasional attacks of pain, swelling, and weakness.

We learn that Baron Dupuytren many years ago made the anatomical examination of the knee-joint of a criminal, who, having been executed in Paris was immediately afterwards transferred to the Laboratory of Anatomy of the Faculty of Medicine. The integuments covering both knees were quite in a natural state, but the joints were greatly tumefied. The swellings, on external examination, gave to the touch a distinct feeling of fluctuation. On making incisions into the joints, there flowed out of one twelve, and from the other thirteen, ounces of fluid, which was viscid and tenacious, and although of a somewhat reddish hue, was transparent, having a peculiar odour, a taste somewhat saline; its specific gravity was to that of distilled water as 105 to 100. The synovial capsules were thicker than natural,

and presented *everywhere on their internal surfaces a number of little soft productions* (pelotons d'apparence celluleuse), of various forms and sizes, which were attached by means of narrow pedicles to the interior of the synovial membrane of the knee, whose surface everywhere presented a remarkably red colour.\*

Rokitansky has also minutely described these pedunculated bodies in the following words :—

“Specimens are to be met with in nearly every collection of large joints (especially knee-joints) in which the capsule is enlarged and thickened, and its inner surface covered with white shreds of various length, which are occasionally so numerous that the joint seems as if it were lined with felt; sometimes the shreds are simple, smoothed, rounded, or rather flattened threads; or they here and there form a membranous patch upon the surface, or have their free extremities split into filaments and resembling a tassel. In extreme cases, *small, smooth, and subovate bodies*, which Mayo compares to melon-seeds, are attached to their extremities, hanging singly or in clusters from each stalk: and lastly, here and there amongst them shapeless masses are attached by broader bases. They all have a fibrous or fibroid texture, and are of innocent character, having nothing in common with the cystic and cancerous productions which are found on normal or anomalous serous membranes.”†

\* Dictionnaire des Sciences Medicales, tom. xxii. p. 148.

† “Pathological Anatomy,” by Carl Rokitansky, M. D. Sydenham Society's Transactions, vol. III., p. 289.

It is clear, then, that very many eminent observers had noticed these growths from the synovial membrane of the knee and other joints, but so far as we have yet adverted to the accounts they have given of them, we do not find that they have positively referred them to any special category of disease, but have considered them, as Sir Benjamin Brodie would seem to have done (in all but in the fifth edition of his work on the Joints), as the simple effect of "*long-continued inflammation* of the synovial membrane."

I must say I had long looked upon such appearances as the result of the disease it is the object of this work to describe, and therefore I was glad in 1847 to avail myself of an opportunity of examining the preparations alluded to, as contained in the Museum of St. George's Hospital, particularly that which had belonged to Mr. Heaviside's collection; and I observed, that besides the "excrescences" above alluded to as hanging from the synovial membrane into the interior of the knee-joint in this preparation, there were also very decided evidences of the joint having been during the lifetime of the patient the seat of chronic rheumatic arthritis. The cartilages had been absorbed, and here and there porcellanoid deposits, with grooves in the line of flexion and extension of the joint, existed.

Although Mayo also considers the case he has adduced as an example simply of long-continued inflammation of the synovial membrane, still, if we look to the history he has himself given of it, we



shall find that his patient had long suffered from occasional attacks of rheumatic gout.

As to the case adduced by Dupuytren as one of "hydrops articuli," I have merely to observe, that we know this to be a term signifying that there is an inordinate quantity of synovial fluid effused into the sac of the joint. We also know such an effusion to be a constant symptom of the earlier stages of chronic rheumatic arthritis, the disease which, I have no doubt, existed in this case. I am induced to come to this last conclusion, not only from the appearances displayed by the dissection, but also because both knee-joints were, as is usual in such cases, symmetrically affected.

Lastly, that these hypertrophied synovial fimbriæ, as well as "subovate bodies, like melon-seeds," should be considered as appearances, the special result of rheumatic gout, that is to say, of chronic rheumatic arthritis, would seem to be now finally settled by the additional evidence of the following case, adduced by Sir Benjamin Brodie in the *fifth* and *latest* (1850) edition of his work on the "Joints:"—

#### CASE XII.

"A woman, who for many years had suffered from rheumatism, affecting especially the knees, was admitted into St. George's Hospital, under the care of Dr. Chambers, on account of a pulmonary disease, from the effects of which she died. On

examining the body after death, the synovial membrane of the right knee was found to be dilated, much thickened, and preternaturally vascular, the inner surface of it being lined by a great number of excrescences, somewhat resembling in appearance the *appendices epiploicæ* of the great *intestine*, but of a smaller size. These presented a smooth membranous surface externally, but on being cut into were found to consist of condensed cellular membrane and fat. The cartilage of the external condyle of the femur had wholly disappeared, and in its place a solid bony matter had been deposited, not unlike ivory in colour and consistence. The bone at this part had a grooved appearance, as if worn by the friction of the patella. The cartilage of the inner condyle was altered in structure, being softer than natural, at the same time that it presented an indented or corrugated appearance on its surface. The patella was wholly deprived of cartilage, the exposed surface of the bone being of a hard and compact texture, and exhibiting distinct indications of its having been worn by friction on the external condyle of the femur. The left knee was diseased nearly in the same manner as the right, and both knees were much enlarged, the enlargement being the result partly of the thickened condition of the synovial membranes, partly of an opaque serum, collected in the articular cavities."\*

\* Brodie on "Diseases of the Joints," p. 234. Fifth Edition.

## FOREIGN BODIES IN THE KNEE-JOINT.

We have said that loose cartilages, or "foreign bodies," sometimes exist in the knee-joints of patients afflicted with chronic rheumatic arthritis of these articulations, that occasionally they can be felt through the integuments during the lifetime of the patient in great numbers, and that on making post-mortem examinations in this class of cases, besides the loose cartilages there are also usually found much developed synovial fimbriæ; the articular surfaces are eburnated and marked with parallel ridges and grooves, &c. For example, Cruveilhier has given the dissection of a case, of which he says, in the knee-joints there were many foreign bodies, some small, others large, some free in the joint, others were connected to the articular surfaces by slender filaments. The synovial membrane of the knee was also furnished with *highly developed synovial fimbriæ*. The articular surfaces were also eburnated, and marked with parallel ridges and grooves in the direction of the movements of the joint.

In pursuing this inquiry as to the varied anatomical characters of this disease, let us next turn to the study of other facts which we can collect relative to this subject, by the examination of the pathological collections in the museums of these and other countries.

In the year 1842, while seeking for examples of the description of articular disease now under consideration, in the Museum of the College of Surgeons in England, I was greatly struck with the appearance and account given of one specimen, now more than an hundred years old, of diseased knee-joint, which I found had formed part of John Hunter's original collection, and which had been dissected and preserved by himself. On reading his own account of the morbid appearances this case presented, we are led to infer that this great pathologist was fully acquainted with the *anatomical* characters of the disease it is the object of this work to elucidate.

We read in the Catalogue of this Museum the following account referring to the above-mentioned specimen, viz.: that John Hunter, in the year 1759, upon making the post-mortem examination of an aged female, the history of whose case was unknown to him, upon cutting into her knee-joints, observed four loose cartilages, one about the size of a nut flattened. In the knee-joints of this subject "the articular cartilages have been removed from the greater part of the patella; the portions near the borders alone remain. The cartilage of the external condyle of the femur has been removed to a similar extent, and the surfaces of bone thus brought into contact, and rubbed against each other in the movements of the joint, are hardened, polished, and worn down in parallel grooves, as if they had been chiselled. The remains of the ar-

ticular cartilage on both bones are thin, and in many places degenerated into a soft fibrous substance ; around their borders the bones are thickened and beset with projecting osseous plates and nodules." The other knee-joint of this old woman was much in the same condition.\*

The late Sir William Lawrence presented a specimen of a knee-joint, thus diseased, to the Museum of the College of Surgeons in England, with the history of which he was unacquainted ; but it is pretty evident that this specimen, which I have examined, and consulted Sir William about, must also be considered an example of the effects of chronic rheumatic arthritis. This preparation is thus noted in the Catalogue :

" A knee-joint, to the walls of which many pendulous masses of bone and cartilage are attached. The extremities of both femur and tibia are greatly enlarged, especially by the heaping up of bone, in large nodulated masses, around the borders of their articular surfaces."

" This formation of *new* bone has taken place chiefly on the outer condyle of the femur and corresponding surface of the tibia, from both of which also, nearly all the articular cartilages, after fibrous degeneration, have been removed, leaving the subjacent bone smooth and hard. The same changes, in a less degree, have affected the inner condyle of

\* Catalogue of Museum of College of Surgeons, England, vol. II., p. 236.

the femur and the rest of the articular surface of the tibia. The pendulous bodies are between fifteen and twenty in number; they are all attached by one of their surfaces, or by portions of tough fibrous tissue, to the walls of the joint, or to the masses of bone around its borders. They are irregular in form and size, varying from half an inch to nearly two inches in their diameter; their surfaces are nodulated, and for the most part osseous, but present isolated portions of substance like semi-transparent bone cartilage. They lie in various parts of the joint, and some small ones at the back appear to have formed *externally* to it. The fibrous tissues around the joint are all thickened and strengthened, with bands supporting and connecting the several pendulous growths."\*

Passing through Germany in September, 1842, I visited the University at Halle, as I was anxious to inspect the anatomical and pathological specimens there collected by the celebrated Meckel. Dr. Munter, at that time the Curator, showed me a knee-joint preserved in spirits, which, he told me, he, and all the visitors he had hitherto exhibited it to considered to be quite an anomalous and unique specimen, the result of articular disease. For my part, I had no difficulty in at once arriving at the conclusion, that this specimen of diseased knee-joint was by no means unique, but that it was a

\* Catalogue of the Museum of the College of Surgeons of England, vol. II. page 236.

very well-marked example of the effects of chronic rheumatic arthritis.

The synovial sac of the knee-joint was much dilated and thickened, and there were contained within it numerous foreign bodies, which were seen hanging from the interior of the walls of the joint. They were of an oblong rounded form; some of them appeared to be an inch and a half long in their greatest diameter. The preparation is, no doubt, a remarkable one, but seems to be quite a *fac-simile* of Sir W. Lawrence's, which, as I have just mentioned, I had seen in the Museum of the College of Surgeons of England. On this account I feel it would be superfluous to enter into further details concerning it.

The history of this specimen contained in the Museum of Halle was unknown.

I have, no doubt, seen examples\* of patients whose knee-joints were affected similarly to the foregoing, and in whom the true nature of the articular disease was sufficiently indicated, not only by the local symptoms, but by the circumstance that very many of the other articulations in the same patient presented all the characters of chronic rheumatic arthritis.

\* See case of Mrs. Cassidy, also of Sheridan: see Index.

## FIBROUS STRUCTURES, CARTILAGES, AND BONES.

The *lateral* and *capsular* ligaments are found in general elongated, and in most instances in a state of hypertrophy. In cases which have been of very long standing, we have seen the capsular membrane of the knee, with its interior lining, to have been greatly thickened; in the case of Sheridan, for instance, in making the post-mortem examination of both knee-joints, which had been long and severely affected with this disease, it was found, that when the capsular ligaments were incised, the cut edges of the capsules in each joint presented a thickness of three lines.

The *crucial ligaments* have been found in various stages of disorganization as the result of this disease; sometimes presenting an unravelled appearance; occasionally having one of their extremities detached from either the tibia or femur. In some instances these crucial ligaments have been removed altogether, as completely as we have observed the round ligament of the femur, or the intra-articular portion of the tendon of the biceps to have been removed under analogous influences of disease.

It is in these cases, in which the crucial ligaments have been altogether removed, that complete dislocation of the bones of the knee has occurred, as the result of chronic rheumatic arthritis of this articulation.



## CARTILAGES.

The articular cartilages of the knee-joint, when examined in cases in which the disease had been in an early stage, will be found to have lost their brilliant hue, and to have assumed a dull yellow colour; they are softened, so as easily to admit of the probe penetrating them, thinned, separated into fibres; and, in a word, in the first stage of disintegration. The semilunar cartilages are generally removed altogether, as the ultimate result of this disease. I have seen but two cases which formed exceptions to this observation. In one of these cases (Lynch), the semilunar cartilages in both knee-joints not only remained, but, strange to say, were in a state of great hypertrophy (see Atlas, Plate VIII. Fig. 4). In the other (M'Garry), the semilunar fibro-cartilages of the knee were converted into bone.

In most cases, however, the interarticular cartilages, as well as those of incrustation, are removed altogether, and the place of these last is supplied by a porcelain-like enamel of a white colour, marked with parallel ridges and grooves, which are seen running in the direction in which this hinge-joint had moved.

## BONES.

It has been already seen that the bones of the knee-joint are, as the result of this disease, found to be more or less enlarged, and increased in

breadth. I may add, that the patella, besides being much thicker and broader than natural, is excavated and grooved vertically (see Plate VIII. Figs. 1, 2, and 5) on its posterior and articular aspect, and may be found to be either partially or completely dislocated externally.

The surfaces formed on the head of the tibia, for the reception of the condyles of the femur, are sometimes much excavated, and the dry bones present a remarkably porous appearance (see Atlas, Plate VIII. Fig. 1), particularly in those who have been bedridden by the disease for years. In others the articular surfaces are eburnated, &c., &c.

In the Sandifort Museum, at Leyden, are to be seen many specimens of this disease, as it affects the bony structures of the knee-joint. When I compare the description and delineations given of these, with some specimens I have in my own possession, the histories of which I am well acquainted with, I feel perfectly certain that those which are referred to by Sandifort in the "Museum Anatomicum" are good examples of the effects of chronic rheumatic arthritis.\*

\* This author's idea of their nature must be considered somewhat vague; and it will be admitted that the specimens are rather equivocally designated in his catalogue. For example, in one place they are referred to as bones of the knee-joint of an adult, "ex hydrope articuli degenerata;" and in another, the change of form is said to have arisen "ex rheumatismo vel arthritide." The author also thinks it necessary to show that they were *not* the result of congenital malformation.—"Museum Anatomicum."

As to the articular surfaces of the tibia, the internal is usually narrower than the external, which last is frequently found to present a large circular outline, partially surrounded by a rim of bone, and elsewhere having a smooth and eburnated surface.

The condyles of the femur have bony vegetations arranged along their lateral as well as their posterior margins, similar to those we noticed around the corona of the head of this bone. These bony vegetations, or nodules of "semi-transparent bone cartilage," are characteristic marks of this chronic disease, whether we examine it in its effects on the head of the humerus or femur, or here on the lateral as well as posterior margins of the condyles\* (see Atlas, Plate VIII. Fig. 2). The internal condyle is usually narrower, and descends somewhat lower than the external, and not unfrequently there is a partial displacement inwards of this condyle.

The subluxation of the femur on the tibia inwards must be looked upon as the most common displacement, the result of this disease; still, examples have not been wanting of deviations occurring, in other directions, of the femur at the knee. For example:—I saw an aggravated case of this chronic disease of the knee lately in the Richmond Hospital, which was under the care of my colleague,

\* For some new views as to the formation of these osseous growths, see "Observations on the Enlargement of the Articular Extremities of Bones in Chronic Rheumatic Arthritis." By W. Adams, London. "Transactions of the Pathological Society,"

the late Dr. Hutton, in which the head of the tibia was partially dislocated upwards and backwards behind the femur ; and in another case of a patient of my own, afflicted with this disease, and who is still alive, the femur is dislocated downwards and backwards, behind the bones of the leg, which, with the patella, are elevated above the front of the lower extremity of the thigh bone.—(See case of Stafford).

As illustrative of the ordinary anatomical characters of this disease, as it affects the bones which enter into the composition of the knee-joint, I may again advert to those specimens which are contained in the Anatomical Museum at Leyden.

Sandifort, Jun., has given engravings of one of these, of which I have here attempted to give representations in miniature (see Figs. 11, 12, pages 215, 216); both these, viz., the anterior and posterior views of the knee-joint, well exhibit one remarkable feature of this affection, which I have before alluded to, when detailing the ordinary symptoms of this chronic disease, namely, the projection inwards of the knee, "*quantopere genua introrsum fuerunt incurvata, ex ipsis figuris, satis elucescit.*"\*

The engravings also show the anatomical cause of this leaning inwards of the knee in the elongation and descent of the internal condyle of the femur below the level of the external.

In Fig. 11, p. 215, the bones of the left knee-joint are viewed from before, and new osseous

\* Sandifort, vol. iv., table xxix.

growths, the result of this disease, are here delineated as having sprung from the margins of the articular surface of the femur, as well as from the lateral and superior margins of the trochlea for the reception of the patella.



FIG. 11.

Left knee-joint, anterior view, after Sandifort.

From this view it is also seen, that the posterior part of the patella had corresponded to the front of the external condyle, *a*.

In Fig. 12 the left knee-joint is viewed from behind. The articular surface of the external condyle



Fig. 12.

Posterior view of same left knee-joint, after Sandifort.

of the femur is observed to be broader than that of the internal condyle, *b*, which last was slightly subluxated inwards. We also notice that the margins

of the articular surfaces of the condyles of the femur have superadded to them bony growths; that these margins are somewhat reverted, or, to use the language of the catalogue, "valde sunt excreti et pro majori parte revoluti."

In this view of the left knee-joint from behind, we also notice that the articular surfaces of the tibia are greatly altered from their normal condition. The portion of this bone on which the external glenoid cavity was formed was observed to have been more compact in its substance than natural, and the surface of it was polished and eburnated, "polita ac quasi eburnea;" the anterior and external margin of the outer condyle of the tibia (*c*, Fig. 12) was in part circumscribed by a rising rim\* of bone, or, to repeat the language of the author as to this margin, "cernitur excretus et revolutus." It seems to have been in this case obviously inferred by the author, from the appearances of the articular surfaces, rather than from observation of the actual condition of the recent specimen, that the cartilaginous structures had been altogether removed.

\* Professor Smith and I each possess specimens, the result of this disease, showing the rim of bone, and the eburnation of the external condyle of the tibia, which critically resemble the engraving by Sandifort.

## CHAPTER V.

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### THE DISEASE IN THE WRIST, AND IN THE JOINTS OF THE CARPUS, METACARPUS, AND PHALANGES.

THE wrist-joint, and the joints of the carpus, metacarpus, and phalanges, are more frequently affected with chronic rheumatic arthritis than any of the other articulations. This disease, as it affects the joints of the hand, has since Haygarth's time been but cursorily alluded to by medical writers. Some have looked upon it as a disease of elderly persons only, showing itself principally in females at the critical period of life ; but although elderly females seem to be the most frequent subjects of this affection, it is to be seen occasionally in the young of both sexes. At the time of the publication of the first edition of this work, I mentioned that I had then under my care in the Richmond Hospital two well-marked examples of this disease—one of them a girl, eighteen years of age, the other a man, aged twenty-seven ; and now, November, 1867, my colleague, Dr. Fleming (knowing the interest I took in such cases as these), kindly transferred to my care the case of a young woman who had been afflicted with this dis-



ease of the constitutional form ever since she was thirteen, and she has now attained her twenty-seventh year.\*

When the disease has had a constitutional origin, the law of symmetry, which so usually prevails in blood diseases, is to be found governing its phenomena. In such cases the wrists, as well as all the small joints of the hands, are affected on both sides, and very frequently many of the other articulations are similarly implicated, as, for example, the elbows, shoulders, and knees.

When the disease is local, confined to one articulation, or to the joints of one region, as to those of the wrist and hand, we find that in most of such cases its origin is to be referred to accident, or to an extraordinary amount of labour having been thrown on the affected articulations.

The wrist-joint, when affected by this disease, presents a preternatural convexity on its dorsal aspect, and sometimes the bursæ here are distended with fluid.\* The lower extremities of the radius and ulna, more especially the latter, seem slightly displaced backwards (see Atlas, Plate x. Fig. 3; and Fig. 17, p. 237), and are usually observed to be enlarged. When the wrist-joint has been long and severely affected by the *constitutional form* of the disease, the motions of the hand at this articulation become limited to those of imperfect flexion only; for abduction and adduction, confined as they are in the normal state of the joint, are now

\* See case of Margaret Burgess, Index.

annihilated, and extension of the hand beyond the line of the longitudinal axis of the forearm is impracticable. The radio-carpal joint in some cases becomes nearly rigid, and any attempt to move it is painful to the patient.

In the inferior radio-ulnar articulation a certain limited degree of rotation, accompanied with crepitation exists.

The back of the hand ultimately presents an attenuated appearance, showing the course of the tendons, and allowing the ridges and prominences of the bones to become visible.

All the median joints of the fingers become enlarged, as well as those which are formed by the juncture of the first phalanges and metacarpal bones. The fingers are usually flexed towards the palm, and are at the same time generally much adducted towards the ulnar side of the hand. The lower extremity of the metacarpal bone, which joins with the basis of the first phalanx of the index finger, seems specially swelled and enlarged, and projects much towards the radial side and dorsal aspect of the hand (Atlas, Plate VI. Fig. 1, also Fig. 14, p. 222). This salient angle, formed on the radial side of the hand by the flexion and excessive adduction of the fingers, is so usual, that the form thus impressed upon the hand is looked upon as quite characteristic of rheumatic gout.

Yet, varieties do occur in the form the hand assumes under the influence of this disease, which we must not omit to mention. We have, for example,

found the lower extremities of the metacarpal bones enlarged, and the first phalanges of the fingers flexed towards the palm, but not in the least degree *adducted* towards the ulnar side, and consequently, in such cases, the angle of junction of the metacarpal bone with the basis of the index finger was by no means salient towards the radial side, but towards the dorsal aspect of the hand only (Fig. 13).

The median and last joints of the fingers are very generally found in a flexed condition, but exceptions to this rule are observed; it is by no means uncommon to find the median joint of one or all of the fingers in a preternatural state of extension, so that the first and second phalanges may form an angle with each other, salient anteriorly towards the palm (Fig. 13), and the excess of the degree of extension



FIG. 13.

A form of chronic rheumatic arthritis of the joints of the hands. (Casts in Author's Museum.)

may amount even to a luxation of the basis of the second phalanx on the dorsum of the first.

Whenever the joint formed by the union of the *metacarpal bone of the thumb with the trapezium* (Fig. 14, A, and Fig. 15, A) is affected with chronic rheumatic arthritis, the line of the articulation is marked by a rising ridge of osseous growth, which can be

seen and felt through the integuments ; in this case the motions of the joints are impeded, but the normal direction of the metacarpal bone does not seem to be altered by the presence of this disease in the articulation, nor does any dislocation occur.

When the disease affects the *metacarpo-phalangeal joint* of the thumb (Fig. 14, B), this last is almost always preternaturally flexed, sometimes even to a



FIG. 14.

Effects of chronic rheumatic arthritis on the hand. A, carpo-metacarpal joint. B, Metacarpo-phalangeal joint of the thumb.

right angle, and adducted at its metacarpo-phalangeal joint, while its last, or unguinal phalanx, is in a marked state of extension (see Fig. 14). Dr. M'Dowel, however, some years ago,\* laid before the Surgical Society of Dublin one instance in which a state of things exactly the reverse of the foregoing



FIG. 15.

Rare effects of chronic rheumatic arthritis on the metacarpo-phalangeal joint of the thumb. A, Carpo-metacarpal joint. B, Metacarpo-phalangeal joint of the thumb.

\* Dublin Medical Press, June 6, 1855, p. 353.

existed, for in this last and rare specimen, the first phalanx of the thumb (Fig. 15) was preternaturally extended, and abducted to a degree which almost amounted to a luxation backwards; while the ungual phalanx was flexed, so that the appearance presented was much that of the accident called Hey's dislocation of the thumb.

#### LUXATIONS OF THE BONES OF THE FINGERS.

Are frequently the consequence of this chronic disease. The most usual dislocation I have observed is that of the first phalanx of the little finger forwards towards the palm, from the head of its metacarpal bone (Fig. 17, p. 237, and Fig. 18, A, p. 239).

Cruveilhier\* has described and delineated a case in which the bases of all the phalanges of the fingers were thus dislocated towards the palmar surface of the hand. This displacement *forwards* of one at least of the *first* phalanges, as the result of this chronic disease, is not, it would appear, of uncommon occurrence. On the contrary, luxation of the *basis* of the first phalanx *backwards* must be considered very rare. Anatomists do not speak of such an occurrence as the result of any disease, and I have seen but few examples of such displacement. However, in visiting Professor Vrolik's Museum, in Amsterdam, in August, 1847, I noticed the

\* Livraison xxxiv. Planche 1.

skeleton of a hand, which, from the appearance of the carpus, &c., I judged had long been affected with chronic rheumatic arthritis. The first phalanx of the little finger had its basis in this specimen dislocated on the dorsum of its corresponding metacarpal bone. This and Dr. M'Dowel's case, already alluded to (Fig. 15), are the only examples of luxation or subluxation of the *first* phalanx backwards which I have seen. These observations, however, it may be necessary to remark, apply only to the metacarpo-phalangeal joints, because we meet with numerous specimens of dislocation backwards at the median joints of the basis of the second phalanx on the dorsum of the first, the result of the disease. (See Fig. 18, B, p. 239, case of P. Donohoe.)

#### DIAGNOSIS AND PROGNOSIS.

It ought not, we should suppose, to be by any means difficult to distinguish chronic rheumatic arthritis of the joints of the wrist and hand from any other affection of these articulations; still, we must bear in mind, that if we have to deal with the case of this disease affecting the region of the wrist, metacarpus, and fingers of one extremity only, and the affection be thus far local, it might possibly be confounded with articular caries of the bones of these regions. That such an error has been committed, in one case at least, we learn from a communication made to the Dublin Pathological Society, in which it is stated that a female of advanced age,

had a disease of the wrist-joint, supposed to be articular caries, which had not suppurated, and yet, upon dissection of the specimen presented to the Society, the morbid appearances proved the case to be one of chronic rheumatic arthritis. The particulars of the case, otherwise interesting, we shall just now have occasion to allude to.

In the case of *articular caries* affecting the wrist-joint, the patient complains of pain, which is increased on the slightest motion; soon a swelling appears on the dorsum of the wrist and carpus; from day to day the hand becomes more flexed; after a time the region of the wrist assumes a globular form; the forearm has a wasted appearance; the patient, we observe, has the hand in the prone position, the palm resting on some flat surface; the whole hand has a most helpless aspect; the fingers are swollen at their basis, and are straight and tapering towards their extremities; and it is with difficulty and pain that the patient moves them. In this last disease of caries, too, we may add, that the constitution of the patient sympathizes much more with the local disease than it does in the case of chronic rheumatic arthritis. In this last disease the fingers are never straight; they are distorted, and present nodosities in all their joints; but still the patient can make considerable use of his hand; he has no hectic symptoms; and suppuration, so common in cases of articular caries, I have never known to occur in the case of chronic rheumatic arthritis of the wrist.

ANATOMICAL CHARACTERS OF THIS DISEASE AS IT  
AFFECTS THE WRIST-JOINT, THE CARPUS, META-  
CARPUS, AND PHALANGES.

When we remove the fibrous covering of the tendons which lie on the back part of the wrist-joint, we find that these tendons are generally sunk down in deep bony grooves on the back part of the radius and ulna. The capsular ligament, both on the back part and front of the wrist-joint, seems to have acquired unusual strength.

At the ordinary advanced period of the disease, at which, only, opportunities of examining anatomically the interior of the bones which constitute the region of the wrist occur, we notice that all the articular cartilage has been removed from the ends of both the radius and ulna. The inter-articular fibrocartilage, which intervenes between the extremity of the ulna and the cuneiform bone, is also removed altogether, so that the ulna now enters into the cavity of the radio-carpal articulation, and the evidence of contact and attrition between the lower extremity of this bone and the cuneiform is seen in the eburnation of the articular surfaces of both bones. There is little left of synovial membrane: in some cases we have found red, vascular, synovial fimbriæ in the wrist-joint, just as we have noticed these fimbriæ in other articulations affected with this disease. Pendulous foreign bodies are sometimes, though rarely, found within the cavity of the wrist-joint.



The lower extremity of the radius is usually somewhat enlarged, and the surface of the bone on its dorsal and palmar aspect is scabrous from small exostotic growths. The grooves formed on the back of the radius for the passage of the extensor tendons are deepened, and are bordered by rising ridges of bone.

The lower articular surface of the bone for the reception of the first range of the carpus is hollowed out and polished, and its aspect is more obliquely inclined forwards than natural. (See Atlas, Plate x. Fig. 1.) The outline of the carpal articular surface of the radius is often studded round with bony granules, and generally there is a thin, sharp edge superadded to the anterior margin of this articulation, which increases the antero-posterior diameter of this surface, and thus accommodates the carpus, which seems usually advanced more than natural—a circumstance accounting anatomically for the slight appearance of sub-luxation forwards of the carpus, and backwards of the radius and ulna, observable in these cases (see Fig. 17, p. 237).

On the lower extremity of the radius, on its ulnar aspect, we notice the lesser sigmoid cavity, for the reception of the carpal end of the ulna, much increased in size and eburnated, and there are seen fine parallel ridges and grooves in the line of the rotation of this extremity of the ulna on the radius.

## ULNA.

The carpal extremity of the ulna is frequently much enlarged, and furnished with exuberant bony growths (see Atlas, Plate III. Figs. 4 and 5); its lowest extremity, where it confronts the cuneiform bone of the carpus (without the intervention of cartilage) is smooth, and sometimes highly polished. The part of this bone destined for rotation on the radius is convex and oval from before backwards, of a form, of course, adapted to that of the little scaphoid cavity in the latter, and, like it, deprived of cartilage, eburnated, and similarly marked with parallel ridges and grooves.

## CARPUS.

In our anatomical investigations into the state of the hands of those who have long laboured under chronic rheumatic arthritis as a constitutional disease, we have found the *bones of the carpus* to be much altered. In general the region which these bones constitute will be found to have all its dimensions contracted within a smaller compass than natural. The form of each individual bone is so much changed, that if found detached, it could scarcely be recognized as a carpal bone; sometimes it may be smaller, occasionally larger than natural. The cartilaginous structure naturally intervening between all the bones is always absorbed.

Cruveilhier has said,\* that in the anatomical examination of one of his cases of this disease, he found the bones of the carpus confounded together into an irregular mass, so that it was difficult to decide what part each took in the construction of the carpal region. In this case the superior extremities of the metacarpal bones were said to have been imperfectly ankylosed to the carpus.

The outer surface of the small carpal bones, after maceration, present a scabrous appearance. (See Atlas, Plate x. Fig. 2.) The ivory-like deposit so frequently observed in other joints is also found investing the articular surfaces of the carpal bones in this disease, more especially of the scaphoid, lunare, and head of the os magnum.

This eburnation in one case, I think, I could easily trace to the exertion the hands had undergone by the continued use of crutches, which were rendered necessary helps in locomotion, as the lower extremities had been so long crippled by this disease.

The following account of a specimen of this chronic disease, as it affected the wrist-joint and carpal bones, may be here introduced. It is the only example I have known in which pendulous foreign bodies were found to exist in the radio-carpal articulation.

During the winter session, December 3, 1853, Professor R. W. Smith laid before a meeting of the

\* *Livraison xxxiv.*

Pathological Society of Dublin a very remarkable specimen of this disease, affecting the lower extremities of the radius and ulna, and carpal bones. "The cartilage had disappeared from all the articular surfaces, and the reticular tissue of the bones was exposed, with the exception of the cuneiform, which presented a highly polished and smooth surface, like that of ivory; it was in contact with a similar surface upon the end of the ulna, the triangular cartilage having been absorbed. The scaphoid bone was greatly enlarged and flattened—it measured an inch and a half in length, and an inch in breadth. The enlargement had taken place chiefly towards the dorsal surface of the wrist. The semilunar bone was also much enlarged, and its centre was traversed by a complete solution of continuity. *Several foreign bodies* (one of which was as large as the pisiform bone) were connected with the dorsal margins of the semilunar and cuneiform bones and adjacent ligamentous structure. There were likewise two connected with the anterior annular ligament and with the palmar aspect of the semilunar bone. The pisiform bone was hypertrophied.

"The lower end of the radius was of immense size, being two inches in extent from side to side, and one inch and a quarter from before backwards and the palmar margin of the articular surface was fringed with large and very irregular stalactiform osseous growths. The portion of the surface which was in contact with the anterior division of the pyramidal bone was slightly polished.

"The inferior radio-ulnar joint was also implicated in the disease, the articular surface upon the radius being an inch in its antero-posterior diameter, its vertical extent being three-quarters of an inch. The lower extremity of the ulna was similarly altered, and its flattened styloid process had become articular, and rested upon the enlarged and eburnated cuneiform bone.

"The external appearance of the joint, before the integuments were removed, resembled very much those which have been described by surgical writers as marking the luxation of the lower ends of the radius and ulna backwards. The patient was a female of advanced age, and the disease had been supposed to be the *ordinary caries of the radio-carpal joint*, but without suppuration having occurred. The chronic rheumatic disease, of which the wrist presented so striking an instance, had also established itself in the metacarpo-phalangeal articulations."\*

#### METACARPUS AND PHALANGES.

When we make the anatomical examination of the hands of a patient whose fingers at the time of his death presented the usual characters of this disease, we find, when the integuments have been removed from the metacarpus and fingers, that the *tendons* of the extensor muscles present a normal

\* Professor Smith's Museum.

appearance as to their structure, but that their usual direction, as they pass from the metacarpus to the phalanges, has been altered; being displaced from their proper grooves, as they pass over the heads of the metacarpal bones, they are thrown towards their ulnar side into new grooves, which have been formed by the constant action of these tendons on the bones. This new position of the tendons on the outer surface of the heads of the metacarpal bones must render nugatory the action of the muscles, to which they belong as extensors; or, if these muscles have now any action on the fingers, it must be to flex rather than to extend them.

The flexor tendons are found to be unaltered, and in their natural position. They have in their course to pass in front of, or around the heads of displaced bones, but they are not so frequently thrown from these grooves as the extensor tendons are.

The *ligamentous structure* we have found increased in thickness when connected with the small joints of the fingers; whether this fibrous structure formed capsular or lateral ligaments, the latter always appeared to us elongated. This elongation we have usually found to exist to a degree sufficient to permit of luxation of the bones, without any of the lateral ligaments suffering interruption of the continuity of their fibres (Fig. 18, A, B, p. 239).

When we cut through the fibrous covering of

any of the joints of the hand, we observe that every trace of cartilage of incrustation has been totally removed, and we notice an abundance of vascular synovial fimbriæ occupying depressions in the interior of the small joints.

The fingers seem rigid, and on a superficial examination we might suppose that some of their joints were truly ankylosed; but true bony ankylosis of the fingers I have not seen. When we examine carefully some of the rigid articulations of the phalanges, such as are neither luxated nor subluxated, we have noticed, in many cases, a red fibro-cellular structure directly intervening between the corresponding articular surfaces of the phalanges, and uniting them together.

#### BONES.

From the bones of the hand all the articular cartilages will be found to have been removed; some of the bones are rough and scabrous, and present a porous appearance; some present a high polish. We have already noticed this last appearance on the scaphoid bone of the carpus, and on the extremities of the enlarged metacarpal bones where they enter into the formation of the joints of the hand; but nowhere do we find the characteristic traces of the chronic rheumatic arthritis of the hand better marked than in the metacarpo-phalangeal joint of the thumb. (Atlas, Plate x. Fig. 4, A.) The trapezium and superior extremity of the first phalanx

of the thumb have their articular surfaces sometimes extended to twice their normal size, and these surfaces are eburnated, polished, and surrounded by exuberant bony nodules. The shaft of the first phalanx of the thumb has generally a characteristic appearance, being bent much towards the palmar surface, and is shorter than natural. (See Atlas, Plate x. Fig. 4.) The metacarpal bones and the phalanges are variously changed by this disease. (See Atlas, Plate vi. Fig. 2.) In many cases we find that the cancellated structure of the bases of the phalanges is exposed, and excavated into a kind of cup, which accommodates the enlarged head of the metacarpal bone, and generally around this cup a growth of new bone, of a looser reticulated texture, is thrown out.

In the removal of the cartilage without suppuration; in the substitution for it of a porcelain-like surface; and in the surrounding exuberant growth of new bone, we find this disease, as it leaves its traces on the joints of the fingers, presenting a perfect similarity to the alterations produced by it in the larger articulations.

The following abstract from the history of a case will serve as an illustration of this disease as it affects the wrist and hand.



## CASE XIII.

P. Donohoe, a carter, aged 38, a man of intemperate habits, had been under my observation for ten years, either in the Richmond Hospital or adjoining Poorhouse. Scarcely any of his joints had escaped the effects of chronic rheumatic arthritis; but I would here call attention to the part of the case which will specially serve to illustrate the disease as it affects the region of the wrist-joint, carpus, and hand. Both hands were similarly affected. I had a drawing taken of his right hand when he was first admitted under my care, November 24th, 1836. (See Fig. 16.) At this period the wrist and hand of the patient were large and strong, such as we might expect to find in a powerful labouring agriculturist. The hand was strongly adducted towards the ulnar side; the thumb was itself also slightly flexed at the metacarpo-phalangeal joint, which was somewhat enlarged; the last phalanx of the thumb was extended. (Fig. 15.) We remarked, that at this period we could with very little force bring the hand to a straight line with the forearm, and thus could do away temporarily with the partial adduction, and observed, that when thus placed mechanically in a proper position, it would so remain for a considerable time. The metacarpal phalangeal joints were slightly enlarged, and the little finger at its median joint was somewhat contracted. (Fig. 16.)

When we again examined, in August, 1846, the same right hand, we found it to have been greatly altered by the slow but gradual advance of disease during a period of nearly ten years. The wrist, we found, was now narrowed, and rendered re-



FIG. 16.

CASE OF P. DONOHUE.—Effects of chronic rheumatic arthritis of the right hand. Copy of a drawing taken on his admission into hospital, nineteen months after the disease had commenced in it. (See Collection in the Museum of the Richmond Hospital.)

markably convex on its dorsal aspect. The lowest part of the bones of the forearm in this region seemed to have undergone a process of partial displacement backwards. The whole hand was emaciated, and strongly adducted towards the ulnar side at the metacarpo-phalangeal joints, and, moreover, the fingers were somewhat flexed at these and the extreme joints, while the median joints were extended even beyond the natural straight line, so as to be rendered convex forwards on the palmar aspect.

When we compare the broad wrist and expanded hand of the patient at the period of his admission into the Richmond Hospital, with the wasted wrist and contracted joints of the same hand



FIG. 17.

CASE OF P. DONOHUE.—Effects of chronic rheumatic arthritis on the same right hand, from a drawing taken nearly ten years after that above delineated in Fig. 15.

ten years afterwards, as represented by drawings taken at the two periods specified (see Figs. 16, 17, pp. 236, 237), we get a melancholy lesson as to the inveterate nature of this chronic disease, and as to the alteration it ultimately produces in inveterate cases on the wrist-joint and hand.

In October, 1846, this man died of dysentery, and the following are the notes taken on making the anatomical examination of one of the hands :—

*The Wrist.*—The carpal extremities of both bones of the forearm were enlarged, and presented, all round their articular surfaces, exostotic growths. The carpal surface of the radius seemed to have its articular aspect directed a little more anteriorly

than natural, which accounted for the appearance of subluxation forwards, or to the palmar aspect of the carpus, having been greater than that which really existed, as well as for the great convexity of the back part of the wrist. This carpal articular surface of the radius presented polished and rough patches. The polish was due to some slight eburnation which was the result of the attrition against each other of the articular surfaces, after the cartilages had been absorbed, while the rough porous appearance at the side of the polished portion was the consequence probably of the vital action of absorbing villi, and vascular tufts, which were noticed to occupy depressions formed in the articular surface of the radius. The styloid process of this bone was misshapen and blunt, and the little scaphoid cavity for the articulation with the lower extremity of the ulna was much increased in size, to accommodate the lower extremity of the ulna, which was also much enlarged; and we could observe that the scaphoid cavity on the ulnar aspect of the radius was to a small extent eburnated, and marked *with ridges and grooves*. These were parallel to each other, and in the direction of the rotation of the ulna on the radius, which motion had evidently created these grooves.

The metacarpal joints of the fingers, as we have already noticed, were the seat of the permanent flexion and adduction of the phalanges, which characterize this chronic disease. The joint formed by the head of the metacarpal bone, and the basis of the

first phalanx of the index finger, was provided with a broad and expanded ligament on the radial side of this joint, and with a smaller and shorter one on its inner or ulnar aspect. The cup-like cavity of the basis of the first phalanx corresponded to a well-marked surface on the *palmar* aspect of the



FIG. 18.

CASE OF P. DONOHUE.—Effects of chronic rheumatic arthritis on the same right hand delineated in Figs 16, 17, as exhibited on post-mortem examination, upwards of eleven years after the commencement of the disease. A, The base of the first phalanx of the little finger luxated forwards. B, luxation of the second phalanx of the right finger, at the median joint, backwards. C, Trapezoides diminished in size, and ankylosed to the basis of the metacarpal bone of the index finger. D, Os magnum, narrowed and ankylosed to the scaphoid. All the phalanges have become slightly curved, as the result of this disease.

lower extremity of the first metacarpal bone. This articular surface was eburnated and highly polished, and much enlarged.

There was a complete luxation forwards of the

basis of the little finger from the fifth metacarpal bone; the lateral ligaments were found perfect, but elongated (Fig. 18, p. 239.)

The middle joints of the fingers were in a state of extreme extension, so that the anterior surface of each finger was arched, its convexity being towards the palmar surface, and was not only incapable of being flexed at the median joint, but could not be brought even to a straight line. Indeed, this excess of extension of the median joint of the ring finger had gone so far, that in this dissection we found that a dislocation of the basis of the second phalanx, B (Fig. 18), on the dorsum of the first phalanx of the ring finger had taken place. As in the other luxation last alluded to, the lateral ligaments, though altered in their direction, were perfectly normal in other respects.

The last or unguinal phalanges of all the fingers were flexed, except that of the thumb, which was extended.

*Carpus.*—The bones of the carpus were exceedingly rough on their non-articular surfaces; each individual bone was found much altered from its normal form; some were enlarged beyond their usual size; others were diminished.

The true annular ligament of the carpus, which connected the small bones together on their palmar aspect, and contributed to maintain the arched form of this region, was much shorter than usual.

When we examined each bone, we found that the scaphoid was eburnated on its superior articular

surface, where it corresponded to a similar surface on the carpal end of the radius. Inferiorly, the scaphoid, instead of contributing with the head of the os magnum to form part of the medio-carpal articulation, was really *united* to the head of the magnum (Fig. 18, D) by true bony ankylosis. The semilunar and cuneiform bones of the first range were much enlarged. The portions of both surfaces of the magnum and lunar bones, which confronted each other, were covered with an ivory-like polish. The trapezium, where it supported the first phalanx of the thumb, was polished on its pulley-like articular surface. The trapezoides (Fig. 17, C) was much diminished in size, and *solidly ankylosed with the metacarpal bone of the index finger*.\* The transverse diameter of the magnum (Fig. 7, D) was not one-quarter of an inch, and the loss of breadth to this degree accounted somewhat for the narrowing of the carpus already noticed. The cuneiform was normal; the pisiform was much hypertrophied.

The junction, then, of the magnum with the scaphoid, and the equally solid bony union of the trapezoides with the metacarpal bone of the index finger, were the only examples in this region, or, indeed, in the whole skeleton of this individual, of true bony ankylosis.

\* It is somewhat remarkable, that in these two circumstances, viz., The ankylosis of the trapezoides with the metacarpal bone of the index finger; and secondly, The great increase in size of the pisiform bone, there was an exact identity in the effects of this disease on the carpal region in Mr. Smith's case, p. 229, and in the foregoing.

Such is this disease, as it affects in the constitutional form the articulations of the wrist and hand; but it would appear that the malady occasionally, though rarely, presents itself as a local disease in these articulations. When the disease is local, confined to one region, as, for example, the wrist, or to the articulations of the wrist and hand collectively, it will, I imagine, be generally discovered that the complaint has come on very gradually, and that the first cause of it has been referred by the patient either to injury, or to an extraordinary amount of labour having been, for a continuance, thrown on the joints which we see affected.

Haygarth mentions the case of one of his patients, a man between 50 and 60 years old, who must be considered to have presented a good example of this disease in its *local form*. "The patient ascribed the complaint to a fall that had violently strained the wrists and fingers, which *were the only seats of the nodes* in this case."

Baron Dupuytren, in his *Leçons orales*, I feel pretty certain, has alluded to this affection of the wrist-joint of the local form, under the denomination of "*a variety of the wrist-joint*."

"There is a variety," he says, "of the radio-carpal articulation, which has hitherto not been sufficiently studied by practitioners. We observe this lesion of the wrist-joint in men who, by sudden, violent, and oft-repeated movements, exercise too much their hands—such as printers and drapers of cloth do, in working forcibly the lever of the press. Under



the influence of their continual efforts, it is very usual to see the ligaments of the wrist become relaxed, and elongated in a manner to permit to the bones movements more extensive than natural: the carpus, ceasing to be solidly fixed to the forearm, yields to the action of the flexor muscles, and places itself in front of the inferior extremities of the radius and ulna; all the signs of luxation of the hand forward appear, but without being accompanied with pain or inflammation. A deformity more or less considerable, and debility of the part, constitute the only inconvenience complained of by the patient."

The Baron seems never to have had any opportunity of ascertaining, by post-mortem examination, the anatomical characters of this lesion, of which he has given the clinical history. In my investigations with reference to chronic rheumatic arthritis, I have, I am certain, met with the "variety of the wrist-joint" alluded to by the Baron; and having had two opportunities of making post-mortem examinations of the state of the region of the wrist and hand in these cases, I laid them before the Pathological Society of Dublin, and I feel persuaded that "the variety of the wrist-joint" of Baron Dupuytren is, in reality, nothing but the chronic rheumatic arthritis of the wrists, &c., in the *local form* produced by over-work. The following are these cases thus recorded:—

In the Winter Session of 1852 I laid before a meeting of the Pathological Society of Dublin two specimens, which I considered had been the re-

sults of chronic rheumatic arthritis of the *local form*, affecting the articulations of the right wrist-joint and hand of the patients. In neither of these cases was there any lesion observable in any of the other joints. It was collected during their last illness from the patients themselves, that they never suffered any other inconvenience from the abnormal joints, than a slight degree of weakness in them, which did not prevent them following their ordinary occupation as labourers; in both cases the lower end of the ulna of the right forearm was greatly enlarged, very moveable, and susceptible of being subluxated backwards and forwards. The radio-carpal joint itself seemed loose, and the transverse measurement of the wrist increased, owing chiefly to the carpal end of the ulna having been enlarged all round, whereby the inter-osseous interval, immediately above the joint, was rendered wider than natural, and the wrist itself broader.

In examining either of these patients, that which most attracted attention was the enlarged and rounded extremity of the ulna, which projected backwards much behind the level of the dorsum of the wrist, forming a tumour the shape of half a spheroid, of about an inch in diameter. The forearm, viewed along its ulnar border, showed towards the front the sharp edge of the flexor carpi ulnaris, and the internal lateral ligament, above an inch in length, could be felt forming a tense cord, which passed obliquely forwards to the carpus. The hand seemed somewhat in advance of the

radius, and was more moveable than natural at the wrist-joint. The enlarged extremity of the ulna could be easily pushed backwards and forwards.



FIG. 19.

Drawing from a cast of Specimen No. 1. The lower extremity of the ulna is seen projecting behind the dorsum of the carpus. The fingers slightly flexed and adducted towards the ulnar side.

All these symptoms and external appearances were similar in both patients, who were labourers, of the same age, about 45, and attributed the condition of their wrist joints—of which, however, they did not complain—to hard labour and over-exertion of their right hands. One of these patients



FIG. 20.

Another view of the same forearm and hand, Specimen No. 1. (In Author's Museum.)

died of fever in the Hardwicke, and the other of bronchitis in the Whitworth Hospital; and Dr. Gordon, one of the physicians to these institutions, was kind enough to send to me the two extremities for anatomical examination. Casts of the right or

affected forearm and hands, in both cases, having been taken, there was then a careful dissection made of them, and the following morbid appearances were observed, and exhibited to the Pathological Society.

In the first of these specimens, No. 1, which was the best marked (see Figs. 19, 20, 21, 22), all ligamentous and fibrous structures were found much hypertrophied. The cartilaginous covering of the articular surfaces of the radius and ulna were remarkably thin and attenuated; while, on the contrary, the triangular fibro-cartilage separating the end of the ulna from the cuneiform bone was greatly hypertrophied. The synovial membrane, where reflected from the edges of the circumference of the articular surfaces of the radius and ulna, was of an intensely red colour, and here a commencement of the growth of the usual vascular fimbriae had appeared.



FIG. 21.

The right ulna, with the almond-shaped portion of bone in the situation of the styloid process; united by a false joint to the radius. Specimen No. 1. (Author's Museum.)

In the usual situation of the styloid process of the ulna, the bone had been very exuberant, and had connected with it the internal lateral ligament of the wrist. This ligament was as thick as a crow-

quill, and fully an inch in length. The portion of bone to which this ligament was attached was about the size and shape of an almond, placed longitudinally (Fig. 21), and had the appearance of having been of recent formation, and was moveable with the ligament; but the most remarkable circumstance here to be noted was, that the almond-shaped portion of the bone was connected by means of a fibrous and fibro-synovial apparatus to the rest of the ulna; in fact, a false joint existed here.

The carpal extremity of the ulna presented a very remarkable abnormal appearance: it was greatly enlarged, and resembled much the upper extremity of the radius inverted (Fig. 22), with its



FIG. 22.

Drawing of Specimen No. 1. Right radius and ulna, viewed anteriorly, in supination. The lower articulating process of the ulna enlarged. Anterior portion of the articular surface of the radius presenting a sharp margin. (Author's Collection.)

thick lip and circular rim exceeding the circumference of the shaft. The circular growth of bone

from the carpal end of the ulna thus formed a projecting edge, a species of corona, from around which the synovial membrane was reflected, and the vascular fimbriæ sprang.

The lower articular surface of the radius (Fig. 22) had its aspect inclined somewhat more forwards than natural, and was much enlarged, an anterior margin having been added to it, as is usual in all cases in which this chronic disease of the wrist exists; the carpus seemed to be articulated more with the anterior half of the articular surface of the radius than with the posterior portion. The bones of the carpus were larger than natural, as were also all the metacarpal bones and metacarpo-phalangeal joints.

The fingers presented in a slight degree the flexion and adduction towards the ulnar side which belong to rheumatic gout, and the bones of the thumb above all others bore the well-marked characters of this disease. For example, the metacarpo-phalangeal joint of the thumb was much enlarged, while its metacarpal bone was shorter and thicker than natural; it was also much incurvated towards the palm; in short, the bones of the thumb in this specimen (Fig. 19) exhibited exactly those alterations in form and size which we have always noticed these small bones to present on the anatomical examination of the hands of those who had been affected with chronic rheumatic arthritis, and which appearances I have elsewhere described (page 234) and delineated. (See Atlas, Plate x. Fig. 4.)

As to the second specimen I produced, the bones had been macerated, and their scabrous surface, now that the periosteum was removed, was well seen.

The bending forward of the shaft of the radius, the additional thin angular edge or lip increasing in the anterior direction, the articular surface, the enlarged carpal extremity of the ulna, were also seen in this specimen, as well as the curious moveable apophyses (as it were an enlarged styloid process united by a false joint to the rest of this bone), and the lengthened lateral ligament,—all these, though in an earlier, or rather in a less developed stage of disease, were equally seen in this second specimen, as in the former example presented to the Society.

*Observations on the two last-mentioned cases presented to the Pathological Society.*

We should be quite at a loss to know to what class to refer the phenomena noticed in these two specimens, were we not afforded some clue to the explanation of them, by our being familiar with the changes produced by chronic rheumatic arthritis on the articular textures—the morbid alterations produced on the bones, apparently by too much wear of the articulations, in the instances I have just adduced, seem analogous to, if not identical with, those which we find to be the result of chronic rheumatic arthritis of the local form, involving the same structures.

It is curious that the two specimens presented exactly the same appearance as to the enlarged styloid process, except that in the first specimen exhibited (Fig. 21), the piece of detached bone seemed nearly double the size of that seen in the second specimen produced. Some may naturally suppose that a fracture of the styloid process in both instances, and failure of osseous union, might have been the source of all the weakness of the joint alluded to, and also find in such an hypothesis an explanation of the phenomena the anatomical examination exhibited. I must say, however, I look upon both specimens to constitute decided examples of the local and hypertrophic form of chronic rheumatic arthritis, and that the disease in these instances was the result of over-work. The detachment of the styloid process, the enlargement of the separated portion, &c., have an exact analogy in the very remarkable circumstance first noticed by myself in 1834, and subsequently by Professor Smith, namely, the connexion of the acromion process of the scapula by means of a similar false joint, in certain cases of chronic rheumatic arthritis of the shoulder.\*

It is also worthy of remark, that, while in the ordinary cases of this chronic disease we usually find the inter-articular cartilages and those of incrustation all removed, and the place of these last supplied by an ivory-like deposit, in one of the cases we are now alluding to, brought before the Society,

\* See case of Byrne, Atlas, Plate III. Fig. 2, B, E. See also page 102.



the inter-articular fibro-cartilage, instead of being absorbed, was really in an hypertrophied condition, and no eburnation of any of the articular surfaces had been observed; upon which we have to remark, that although a hypertrophied state of the inter-articular fibro-cartilage is rarely found in the examination of joints which have been affected by chronic rheumatic arthritis, still we have noticed this hypertrophy in the inter-articular fibro-cartilages of the knee-joint (see Atlas, Plate VIII., Figs. 3 and 4, case of Lynch) in a decided example of the chronic disease alluded to. Moreover, it is to be recollected, that the absorption of the cartilages and the eburnation of the surfaces are rather late effects of chronic rheumatic arthritis; and that in these two cases, although the disease may have existed in the radio-ulnar and radio-carpal joints for years, yet it had so happened that it had not made much progress. It is to be recollected, also, that eburnation is not always found in cases of this disease; and indeed is only to be met with where much friction and attrition of surfaces existed—circumstances which were not to be expected when the wrist-joint was stated to be so very moveable. That the affection must be considered as a form of chronic rheumatic arthritis I cannot doubt. The peculiar appearance of the ulna (Figs. 21, 22); its carpal articular portion having been so exuberant and so much enlarged; the highly vascular condition of the sub-synovial tissue of this and of the radio-carpal joint; and the enlargement and pro-

minent sharp lip anteriorly of the lower articular extremity of the radius; the bending forward of this bone so often alluded to; to which may be added, the hypertrophy of the several bones of the hand—particularly of the thumb—and the characteristic adduction or inclination of all the fingers towards the ulnar side of the hand—all these peculiarities, which existed in these two specimens, were similar to those we have always observed to be present when chronic rheumatic arthritis affected the joints of the wrist.

## CHAPTER VI.

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### THE DISEASE IN THE ANKLE, THE JOINTS OF THE TARSUS, METATARSUS, AND TOES.

THE ankle-joint is rarely affected by chronic rheumatic arthritis, and the symptoms and anatomical characters it presents, when it occurs in this region, have not hitherto been described.

In those who are affected by this disease in the ankle-joint, the malleoli, or bony eminences which mark the articulation laterally, are observed to be much more prominent than usual, and the breadth of the space between them seems increased. The joints of the tarsus are usually implicated in the same morbid action, hence the symptoms we notice are seldom referrible to the ankle-joint alone; the navicular bone and head of the astragalus, in these cases, project somewhat on the internal margin of the foot; the instep, too, becomes depressed, and the sole flattened. In such cases, also, there is a degree of swelling, the amount of which may be ascertained (if both feet be not simultaneously affected) by measuring the circumference of the

tarsus round the instep and sole. The foot, too, has a peculiarity in its appearance, arising from the projection inwards of the navicular bone and depression of the instep, already adverted to, which give to it a resemblance to the morbid condition called "flat foot."

The ankle-joint is found to be more or less stiff, and if we desire the patient to move it, and at the same time apply the ear close to the joint, the usual crackling or crepitus is heard.

The *medio-tarsal joint*, that is to say, the articulation formed behind by the astragalus and os calcis, and in front by the posterior articular surfaces of the navicular and cuboid bones—this transverse joint of the tarsus thus constituted is generally more affected by this disease than any of the other articulations of the foot.

In these cases there is an obvious stiffness in this median joint of the tarsus: the patient seems to have lost the usual elasticity in the motion of the affected foot; he never seems to spring from it as he goes up stairs, and as he descends with difficulty each step, we observe him place his heel down suddenly and abruptly. The form and direction of the phalanges of the toes are observed to be changed from their normal state. The metatarso-phalangeal joint which forms the ball of the great toe is generally much enlarged, and the great toe itself is drawn outwards, sometimes to the degree to cross transversely the other toes. The phalanges of the smaller toes are generally arched, the convexity

being upwards towards the dorsum of the foot ; they present nodosities of all their joints, and become variously distorted ; they lose their parallelism, and cross sometimes over and sometimes under their neighbouring phalanges ; and in the *same foot*, both of these last mentioned deviations may occur. (See drawings in the Richmond Hospital collections, and figures.)

The patient who is affected with this disease of the ankle and joints of the tarsus, &c., has the same general symptoms which belong to this chronic rheumatic disease, in whatever region it is situated. He, therefore, states that he suffers much during cold and damp weather ; that when he first gets out of bed in the morning, the joint of the affected ankle and feet are stiff, and the movement of them painful to him ; that he improves under exercise : he adds, that he is always worse on the day succeeding one on which he has much exerted himself. The patient, too, has occasionally spasmodic pains or cramps, which seem to him to start back from the toes towards the ankle-joint and up the front of the leg. In these well-marked cases of chronic rheumatic arthritis of the ankle and tarsus, &c., some of the other articulations, particularly those of the opposite ankle and foot, as well as of the wrists and hands of the patient, are symmetrically affected—a combination of things which, when it exists, renders the diagnosis as to the true nature of the malady in the ankle and foot by no means difficult.

As the clinical history of this disease, as it affects the ankle-joints and those of the tarsus, metatarsus, &c., is as yet but little known, it may not be unprofitable here to introduce the following case, which was under our observation in the Richmond Hospital for some months.

#### CASE XIV.

CHRONIC RHEUMATIC ARTHRITIS ENGAGING PRINCIPALLY THE ANKLE-JOINT, THE HAND, THE TARSUS, METATARSUS, AND TOES.

Michael Leonard, aged 38, a house-servant, was admitted into the Richmond Hospital, on the 25th of July, 1854. He stated that, while labouring under the effects of intoxication, he exposed himself to cold by sleeping all night during damp weather in a hall, open to the street; that from this cause he became affected with a *severe* rheumatic fever, which continued for six weeks, after which time he so far recovered that he felt himself able to resume his ordinary occupation as an inside servant. He continued well for two years, and in 1853, at a time when the Great Industrial Exhibition, in Dublin, had attracted many visitors to the city, he was engaged as a waiter to a hotel. In this service, which proved at the time a most laborious one, he was exposed, when over-heated, to draughts of cold air, and to sudden changes of temperature, while he was also compelled to be constantly "on the foot"

from five o'clock in the morning until one after midnight. Having been for two months thus incessantly occupied, his ankles and feet began to



FIG. 23

swell, and became painful to him ; he stated he felt in them a burning sensation. If he sat down for a time, the pains were relieved, but were renewed

with increased severity when he again commenced to walk. Subsequently his hands became affected, and now he felt obliged to give up his occupation as waiter, and he obtained admission into the Richmond Hospital.

On viewing his ankles from before, their unusual breadth across between the malleoli first attracted our notice. The instep seemed depressed, the foot flattened, and the astragalus and navicular bone were observed to be unduly projecting inwards. The measurement across the tarsus in this situation was found to be, for the right foot  $10\frac{3}{4}$  inches, and for the left one a quarter of an inch less. He could flex and extend the foot, but not perfectly, and there was an articular crepitus perceived on moving the right ankle. He stated, that when he walked on a flat surface, as, for instance, on the flags of the street, both ankles bearing equal pressure, the pain he felt in the inner side of the right ankle was very severe; hence, whenever he could, he contrived, in walking, to place the sole of the foot most affected on an inclined part of the side of the street or road, taking advantage of any inclination of surface which permitted him to throw the principal part of his weight in walking on the outside of the foot and outer ankle. We observed that he could go up stairs with facility, but that he came down awkwardly: he descended each step very abruptly on his heel, and there seemed to be as little elasticity in this movement as if he walked with a wooden leg.



In short, in going up and down stairs, the foot seemed, so far as related to the functions the anterior part of it usually performs, to be quite passive in these movements: he threw no weight on the tarsus or metatarsus; and on this circumstance seemed to depend much of the peculiarity of the patient's mode of progression. He stated that moderate exercise he found of use to him, but if he walked much, he suffered next day severely. On the other hand, complete repose of the affected joints for any length of time he considered positively injurious. He illustrated this last remark by saying: "I have tried the experiment while in hospital, whether *complete* rest of the joints would be useful to me, and I have found that after continued rest (for instance, for five days) my joints became so stiff that I did not for two days at least recover the same power of motion I had lost by the five days' previous repose." "The pains" he found much influenced by the state of the weather. He added, "that during the *severe frost* of last winter he suffered most severely." He thinks damp equally injurious to him as frost: during warm and dry weather he is always much better. We noticed that during the last six months the patient was visited by occasional exacerbations of pain, heat, and swelling of the ankle and joints of the foot, which would last for two or three days at a time; these were not accompanied nor preceded by any constitutional disturbance, nor could they be referred to any obvious exciting cause; he sometimes had

spasms which would "jerk" backwards from the toes to the ankle along the front of the leg. The toes also presented the deformity which is usual in the commencement of the disease ; they were much elevated or arched above the level of their corresponding metatarsal bones, forming a curve convex on the dorsal aspect of the foot (Fig. 23) ; the metatarso-phalangeal joint or ball of the great toe was enlarged, and the toe directed much outwards ; all the extensor tendons on the dorsum of the foot passing to the toes seemed tense. He complained of wandering rheumatic pains, particularly in the shoulders, and here crepitus was perceptible ; the hands, though not now swollen or painful, preserved the characteristic appearance of this disease ; we noticed the fingers to be preternaturally extended, and somewhat adducted towards the ulnar side (see Fig. 23). He left the hospital on the 10th of August, 1855, much relieved of all his symptoms, but still preserving many traces of the disease in his feet and ankles ; he was advised to go to the seaside as a means of improving his general health.

As to the result of the *treatment* in this case, all we have to remark is, that when he was discharged from the hospital he was in every respect much improved. On the 6th of September, 1855, he again presented himself at the hospital, not for admission, but to show his improved state ; and it seemed to give him much satisfaction to be permitted to exhibit to us how much better he could go up and down stairs than he could previously do, but the

usual deformity of his feet and hands of course remained, and the ear could still detect distinct crepitus in every movement of the right ankle. It may be inferred from the statement made by the patient himself upon the important question whether rest was useful or not, that moderate exercise was, on the whole, beneficial to him, but that absolute rest and complete repose of all the affected articulations for several successive days was decidedly injurious.

As to local treatment of the ankles and feet, he found stimulating liniments occasionally of service; he never omitted to use around the ankles flannel rollers. During the occasional short *exacerbations* of the disease he suffered in the ankles and feet, he found considerable relief from the application of carded wool covered closely with oil-silk, and confined by a bandage. Upon referring to his own opinion upon the effects of different medicines which had been given to him, he replied, that he considered that the hydriodate of potash mixture of the Hospital, although he had persevered in its use for two months, did not afford him any benefit; that his own impression was, he derived more decided good from the continued use of the Chelsea pensioner electuary than from any medicine he had taken during his sojourn in the hospital.

It is now, when I write, about twelve years since M. Leonard left the Richmond Hospital in an improved state of health. I saw him lately, and he informed me that ever since he was discharged he had, with very few interruptions, been able to earn

his livelihood as a waiter at an hotel. His general health is good, and he states, that now he suffers more from a sense of weakness and stiffness of the joints of the ankles and feet than from pain. His case affords us an example of the truth of the late Sir B. Brodie's observation before quoted—that if Rheumatic Gout be treated in the very earliest stage of the disease, it may, after having reached a certain point, become stationary, or there may be some degree of improvement

ANATOMICAL CHARACTERS OF CHRONIC RHEUMATIC  
ARTHRITIS AS IT AFFECTS THE ANKLE, THE TAR-  
SUS, METATARSUS, AND TOES.

The changes the structures which enter into the composition of the ankle-joint undergo, under the influence of this disease, will no doubt be found to be analogous to those alterations which the same disease has been known to produce on the other articulations already adverted to; but as the disease has been rarely examined anatomically in this region, our actual knowledge upon the subject in question must be considered to be at present very limited. On this account, the two following examples of this disease as it had affected the ankle-joints seem to me to be worthy of notice.

In the year 1846-7, I frequently visited a patient in the North Union Poorhouse (M'Garry), who presented in his person a remarkable example of chronic rheumatic arthritis, which had engaged

symmetrically almost all the joints of the upper and many of those of the lower extremities, the ankles included. This patient died on the 19th of February, 1848, and through the kindness of Dr. Kirkpatrick, Physician to the institution, I was afforded an opportunity of investigating anatomically the effects of this disease on all the articulations. Omitting in this place any of the other particulars of the post-mortem examination of this case, I shall confine myself to the description I find entered in my notes relative to the appearance the ankle-joints presented. These articulations were not by any means in the same advanced stage of disease that the other joints were found in, but it had evidently commenced, and even had made some little progress in them ; the synovial membrane had lost its polish, and the cartilage investing the articular surface of the astragalus had degenerated as to colour, and become of a deep yellow hue. On close inspection this cartilage was found to be thinned, and on its bridge-like upper surface could be discovered very fine but *distinct parallel ridges and grooves* in the line of flexion and extension of the joint. The bone around the margins of the thinned articular cartilage was in an hyperemic condition, as well as the subsynovial cellular tissue, which occupied recesses here and there, near the margins of the thinned and degenerated cartilages.

With respect to this patient, we may here observe, first, that he had laboured for years under this disease, and latterly had been bedridden from it ; and

secondly, that the ankle-joints had been only for a short time affected by it. Under these two circumstances, therefore, it was not to be expected that any eburnation of the articular surfaces of the ankle-joint should have been found. As, however, the superior articular surface of the astragalus was thus marked with parallel ridges and grooves, it is plain that a process of disintegration of the articular cartilage had commenced, and we may add the conjecture, that had the patient become well enough to have been able to walk, it is probable that the usual changes would have succeeded to the removal of the cartilage, that is to say, the reticular texture or cells of the bone should have been next exposed, and these last have been ultimately filled up with a stratum of ivory-like deposit, forming a polished surface, marked with the usual parallel ridges and grooves in the bone, in the direction of flexion and extension, the only movements the ankle-joint enjoys.

Dr. Power, Professor of Anatomy to the Royal College of Surgeons, when demonstrating last winter to his class the normal anatomy of the ankle-joint, remarked in one of the articulations he had prepared for this purpose the following abnormal appearances :—The cartilage investing the superior articular surface of the astragalus was marked with parallel ridges and grooves ; these were so very fine as to require close inspection to see them, but when placed under water they became very conspicuous, and he at the moment directed the atten-

tion of his class to them, as well worthy of their notice. Upon examining the inferior articular surface of the tibia, which had been in contact with the astragalus, similar parallel ridges and grooves were equally visible. The synovial membrane in this case, in his opinion, presented nothing peculiar in its aspect, but he considered this sac had contained more synovia than he had usually found on dissection. The history of this case was unknown, but the appearances were so much those that the Professor was familiar with, as having often seen them in other hinge-joints which had been affected with chronic rheumatic arthritis, that he, therefore, was induced carefully to examine the articular structures of the other articulations in this individual, and he found that almost all, particularly those of the wrists and hands, exhibited the well-known anatomical characters of chronic rheumatic disease.

These two are the only examples I am aware of in which any traces of chronic rheumatic arthritis have been seen in the ankle-joint,—if I except one other case, which, although the record of it bears a date now more than one hundred years ago, must be considered to have been a case of this chronic disease, we now name chronic rheumatic arthritis, which had affected many of the joints of the same individual, that of the ankle included. In the Hunterian manuscripts we find an account of this case nearly as follows: John Hunter made the dissection of the body of an old woman who died in St. George's Hospital, of whose history, he

states, he knew nothing. He found foreign bodies in both her knee-joints, and one of these bodies in her ankle. "On turning down the patella," he observes, "I saw that the cartilage was almost eroded off, both it and the end of the femur, in parallel grooves. I examined the joint *of the ankle*, and observed a piece of bone, about the bigness of a pea, within the cavity of the joint, but attached to the ligament of the joint by a strong ligament; however, it was loose, so as to be moved from side to side. Both these I have prepared."\*

Thus, then, many of the ordinary morbid appearances observed in the anatomical examination of the joints of those who had been affected with chronic rheumatic arthritis have been noticed also in the ankle-joints under similar circumstances of disease, with the exception of one characteristic phenomenon, namely, eburnation of the surfaces, which, as far as I can collect, has never yet been observed in the ankle-joint. The same observation, however, cannot be applied to the bones of the tarsus, because the medio-tarsal joint,† the neigh-

\* Catalogue of Museum, College of Surgeons of England, vol. II., p 225; also Hunterian MS., An Account of the Dissection of Morbid Bodies, page 70, No. 54.

† I have thought we may name this the *medio-tarsal* joint, that is to say, the double articulation formed behind by the most anterior part of the astragalus and os calcis, and in front by the back part of the cuboid and the cup of the navicular bone. We may here observe, that it is in the transverse line of this same articulation that the operation well known in surgery, called Chopart's "partial amputation" of the foot, is performed.



bouring articulation to the ankle, has, under the influence of this disease, been known to have had its surfaces completely eburnated, as well as marked by parallel ridges and grooves.

We have had for many years, in our collection at the Richmond Hospital, examples of the effects of this chronic disease on the bones and articulations of the tarsus, more especially on the astragalus and navicular bone; some of these I have delineated (see Atlas, Plate IX., Fig. 11).

Professor R. W. Smith has laid before a meeting of the Pathological Society some of these specimens I allude to, with others besides from his own Museum. On the occasion of his presenting these specimens, he stated that he had never seen the ankle-joint show any traces of this disease, but had frequently noticed the head and neck of the astragalus much deformed by it, and that in a few instances he had observed its effects on the surfaces of the calcaneo-cuboid articulation.

He exhibited three specimens of the astragalus as illustrative of the changes produced by the disease on this bone: the alterations were similar in all, and confined to the head and neck of the bone; in all, a process of bone (see Atlas, Plate IX., Fig. 11, D) had sprung up, from the anterior part of the neck, D, rising above the level of the upper articulating surface of the bone; the anterior surface of this new growth was in all the specimens continuous with, and formed part of the articulating surface of the head of the astragalus. The navi-

cular bones, c, in each had undergone changes in form exactly corresponding to that which took place in the head of the astragalus. The hollow glenoid-shaped surface of the navicular bone, and the rounded head of the astragalus, where they confronted each other, were eburnated and marked by parallel ridges and grooves, which might be supposed to be formed by the attrition of the surfaces of the two bones against each other, in the movements of the foot at the medio-tarsal joint; the ridges and grooves were directed from above downwards, with some inclination inwards, from the dorsum to the sole of the foot.

Professor Smith concluded his communication by remarking that this was the first time that any examples of chronic rheumatic arthritis of the tarsal bones had been exhibited before the Pathological Society, nor was he aware that the disease had been described before.\*

The Professor also subsequently (January 4, 1845) showed a remarkably fine specimen of this disease affecting the joint between the metatarsal bone and the first phalanx of the great toe; the joint was greatly enlarged, forming a tumour, somewhat of a globular shape, and larger than a walnut shell; all the structures entering into its composition were intensely vascular; the bones were of a bright scarlet colour, deprived of their cartilage of incrustation, and grooved in the line of flexion; the

\* "Reports of the Pathological Society," April 22, 1842.

end of the metatarsal bone, greatly enlarged, was received into a cavity of a glenoid form, and constituted by three bones,—viz., the end of the phalanx and two sesamoid bones; the long axis of this glenoid cavity was placed vertically, and was nearly two inches in length (see Atlas, Plate x., Figs. 8, 9, 10, and coloured drawing, Richmond Hospital Museum).

The remarkable alteration in the direction of the phalanges of the toes\* which takes place has been already described; and as to the anatomical changes induced by this disease, all we have to say is, that

\* I should not omit here to refer to some observations by Mr. Edwin Canton of London, on this disease as it affects the metatarso-phalangeal joint of the great toe. His remarks remind us, that chronic rheumatic arthritis, as it affects this as well as other joints, demands more attention from the Profession than it has hitherto received. For example, he refers to cases brought before the Fellows of the Medical Society of London so lately as November, 1850, and published in the *Lancet*, as cases of "Luxation of the *Distal Extremity of the Great Toe*," yet the appearances were perfectly characteristic of the chronic affection we are noticing: the author of the paper in question, in detailing his experience of the morbid appearances found on dissection of the joint in such cases as those he brought before the Medical Society, says: "The synovial membrane breaks up, and in a great degree disappears; the cartilage disappears; lastly, *the extremities of both bones, which were incrustated with cartilage, acquire an ivory surface.*" "Yet has he failed," says Mr. Canton, "to recognize in these appearances the affection as one simply of chronic rheumatic arthritis, as it really was. The other joints of the body should have been examined, and I doubt not that marks of this complaint would have been readily recognized in them."—*Surgical and Pathological Observations*, by Edwin Canton. *Lancet*, VOL. II. p. 554. 1850.

these changes are analogous to those we notice in the fingers. There is the same nodosity of the small joints (see Atlas, Plate IX., Figs. 6 and 9), the same displacement of the tendons, which are thrown off the convexity of the curves formed by the bones in the direction of their length.

## CHAPTER VII.

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### THE DISEASE IN THE TEMPORO-MAXILLARY ARTICULATION, OR JOINT OF THE LOWER JAW.

THE structures which enter into the formation of the temporo-maxillary articulation are sometimes, though rarely, visited by chronic rheumatic arthritis. I cannot discover that any recognised instance of the occurrence of this disease in this joint has been recorded, until Cruveilhier, in the year 1830, published a well-marked example of it, being the case of an individual in whom, besides the temporo-maxillary articulation, both shoulders and hip-joints were symmetrically affected by this disease, called by him "Usure des Cartilages Articulaires,"\* the same affection which I have thought may be more appropriately named "Chronic Rheumatic Arthritis."

"I have never seen (observes Cruveilhier,\*\* in alluding to this case) the disease I call *wearing out (usure) of the articular cartilages* better marked than it was in the left temporo-maxillary articulation of this individual. The condyle of the lower jaw did not exist; it might be supposed to have

\* "Anatomie Pathologique," Liv. ix.

been sawn off horizontally at the line of junction of the head with its neck, and that which remained of the neck had been flattened. The articular part of the glenoid cavity was represented merely by a plane surface; no trace of inter-articular cartilage, or cartilage of incrustation, existed. Both surfaces of the altered articulation *were remarkably red.*" In the above description, Cruveilhier accurately details the anatomical characters of this disease, as it affects the temporo-maxillary articulation. We may infer that the symptoms and history of the case were unknown, for he concludes his account of it by observing: "I am persuaded that the old woman who was the subject of the preceding observations had been tormented for a long time before her death with an articular rheumatism, which had fixed itself in the articulation of the lower jaw, and in the other joints already specified."

The second recognised example of this disease, as it affects the temporo-maxillary articulation, which I am aware of having been brought before the profession, was the case of a female patient of mine, whose history I detailed to the Medical Section of the British Association, which held its meeting at Bristol, September, 1836. On this occasion I exhibited to the Section a drawing\* of the above-mentioned patient, which showed that her visage was greatly distorted by the enlargement of the condyle and ramus of the lower jaw at the right

\* Collection in the Richmond Hospital. (See also Atlas, Plate 1.)

side, and that her hands also bore evidence of having been affected with the same chronic disease. About four years afterwards this patient died, and I was afforded an opportunity of witnessing the changes which this chronic disease had produced on the joint of the lower jaw, as well as on the other articulations of this individual. The following is the history of this case :—

#### CASE XV.

Mary Keefe, aged 30, unmarried, was admitted into the Richmond Hospital in the year 1835. She was altogether disabled from earning a livelihood in consequence of her having been afflicted with chronic rheumatic disease in most of her joints. Her face was quite awry, her chin slightly advanced, and its central point passed one inch across the middle line towards the left side. The fingers of both her hands, from the metacarpal joints, were in the same manner adducted towards the ulnar side, and strongly flexed, and the first phalanx of the little finger of the right hand was dislocated towards the palmar surface of the last metacarpal bone (see Atlas, Plate VI., Fig. 2). She complained of pains in all her joints, but principally in her wrists, hands, and feet; but I remarked that the toes of both her feet were distorted, and some of them elevated above the level of the rest (see Atlas, Plate IX., Fig. 9). When we interrogated her particularly as to her lower jaw, she said she had a con-

stant aching in it, and in the right side of her face. She also made the usual complaint of the changes in the weather causing an aggravation of her sufferings. She seemed uniformly querulous, and had a sad expression of countenance, indicative of suffering. Speaking and eating caused her to feel some pain in her ear, and in the articulation of her jaw. To open her mouth completely, she felt was impossible, and she stated that whenever she moved the lower jaw, she was conscious of hearing some peculiar noise in her right ear, corresponding with each motion of the joint.

The previous history of her case, we collected from her, was, that she had always resided in a damp cabin, in the county of Wicklow, with her parents, who were very poor; that she never had anything the matter with either her jaw or her hands, nor did she remember that she ever had been ill, until about five years before the period of her admission into hospital, when she had been attacked with rheumatic fever, which lasted some weeks only, but from the effects of which she never recovered; in short, from her own account it would appear that when the acute attack and fever had subsided, the chronic disease at once became established, and her sufferings becoming daily more severe, she at length came to Dublin for advice, and was for some months in hospital under treatment, which, however, as might have been anticipated in such a case of confirmed disease, was of but little use, and being destitute,



and unable to support herself, she was transferred to the neighbouring North Union Workhouse. When she had been for about three years an inmate of this institution (during which her disease underwent no improvement), she became suddenly affected, on the 28th of July, 1840, with acute œdema of the larynx, which at that time seemed to prevail epidemically. This attack, after a few hours' duration, proved fatal to her.

*Post-mortem Examination.*—Having, through the kindness of Dr. Gordon, first procured a cast of her face (see Atlas, Plate 1., Fig. 4), the articulation of the lower jaw was then exposed by dissection.

When the thickened capsular ligament was cut into, the condyle of the lower jaw was found divested of all cartilaginous covering, it presented a rough, scabrous-looking surface; the neck of the condyle was more than an inch long, and was double the size of the neck of the opposite condyle; from its inner side a large bony spicula, about one quarter of an inch long, grew upwards and inwards, immediately in front of the internal lateral ligament (see Atlas, Plate 1., Fig. 1). The inter-articular fibro-cartilage was altogether removed, as well as all cartilaginous covering, from the articular portion of the glenoid cavity, which was smooth, and expanded to nearly twice its normal size, at the expense of the maxillary eminence and root of the zygoma. The right ramus of the lower jaw, from its angle to the head of the bone inclusive, was not only an inch longer than natural, but was much

thicker than the ramus of the left side, and was also bowed outwards, circumstances which accounted for the swollen appearance of the right side of the face and the projection of the chin to the left.\*

When we contrast those two examples of this affection—the one recorded by Cruveilhier, and the other, as above, by myself,—we find the former to be the case of an old woman, in whom, so far as the lower jaw was concerned, a state of atrophy of the bone seemed to have been combined with this chronic rheumatic disease. The author observes: “The condyle did not exist; one might have imagined it to have been sawn off horizontally at the union of the head with its neck.” The glenoid cavity also was nearly effaced, so as to represent a plane surface. But the simultaneous coexistence in the patient of the same disease in four other articulations, viz., in both shoulders and both hip-joints, placed it beyond conjecture, that the disease which affected the temporo-maxillary articulation was identical with that which existed in the four other joints.

\* All these appearances are displayed, Atlas, Plate I.; the enlarged condyle and corresponding large glenoid cavity of the right side are here contrasted with the normal condition of the bones of the articulation of the left side; while the true nature of the disease in the temporo-maxillary joint is, as it were, identified by the drawing in the same plate of the patient's left hand, which bears the stamp of the effects of chronic rheumatic arthritis. The patient's right hand also, and both feet, were symmetrically affected by this disease, as above mentioned. Besides Plate I., see also Atlas, Plate VI., Fig. 2, and Plate IX., Fig. 9, c, which figures refer to this case.

With respect to the second case, viz. : that of Mary Keefe, it appears that she was only about twenty-five years of age at the time the chronic rheumatic arthritis, succeeding to a rheumatic fever, first established itself in her constitution ; it showed itself early in her hands and feet, and was accompanied by those remarkable symptoms which characterize it in whatever joint it may be found. Subsequently the right temporo-maxillary articulation became implicated in the same morbid action which affected the hands, elbows, and feet. The head, neck, and ramus of the lower jaw all became hypertrophied, and the appearances which these altered bones, and the enlarged glenoid cavity presented at the time of the patient's death, may be strongly contrasted with the account given by Cruveilhier, of the atrophied state of all the structures forming the temporo-maxillary articulation in the case adduced by him.

In both cases the disease in all the joints was of the same nature. In the one individual, however, an elderly female, it was combined with an *atrophy* of the bony tissue. In the other, on the contrary, the patient was young, and a state of *hypertrophy* of the osseous structure, so far, at least, as the temporo-maxillary articulation was concerned, was found associated with that morbid condition of this and several other joints, which we have denominated chronic rheumatic arthritis.

Professor R. W. Smith has contributed his share towards making better known the anatomical cha-

racters of this disease, as the temporo-maxillary articulation has been affected by it. He presented at a meeting of the Pathological Society eleven specimens of this disease, from which it would appear that in the majority of cases it occurred in old subjects, and that the diseased appearances affected equally in the same patient *both temporo-maxillary articulations*. In some cases he found the glenoid cavity deeper, in others shallower, than natural, and in many instances increased as to its circumference; this enlargement had been accomplished at the expense of the horizontal and transverse roots of the zygomatic arch, more especially of the latter, which in all cases he found to be more or less worn away or absorbed. With other observers he has remarked, that the articular cartilage and cartilages of incrustation were frequently removed; but he had seen only one specimen of porcellaneous deposit on the bony surfaces, and added, that he had not in any case found foreign bodies in the interior of the joint.\*

The *symptoms* of this disease as it affects the temporo-maxillary articulation have not as yet been so well ascertained as the morbid results which the anatomical examinations of the different structures entering into the formation of the joint have made known. The patient's attention appears to be usually drawn away from the consideration of this complaint, as it affects the jaw, by the more severe sufferings which he generally endures from its

\* Reports of the Pathological Society, Dublin Journal.

simultaneous existence in some of his other articulations, as the wrists, elbows, knees, &c. Upon particular inquiry, however, we shall learn that the patient hears peculiar and disagreeable noises\* when the jaw is moved, and complains of much stiffness in the articulation, and of an inability to open the mouth fully, more particularly when he first awakes in the morning.

As in some few cases the condyle and ramus of the lower jaw may be found enlarged and elongated, so in others the neck of the bone may be so much shortened as not to rise above the level of the coronoid process; hence, it is plainly to be inferred that although an altered position of the chin is a phenomenon to be expected in those cases, no special position of its central point can be referred to as a pathognomonic sign of this disease.

In some rare cases, as in that of Mary Keefe, there may be an hypertrophy and elongation of the neck of the condyle, as also of the ramus of the lower jaw on one side, and in such a case there must, of course, be a crooked or distorted state of the lower part of the face, and the chin will point to the opposite side. On the contrary, when the disease affects symmetrically, as it most frequently does, both temporo-maxillary articulations, the chin becomes advanced and elevated as in the old and edentulous subject.

We may learn something of the actual state of the condyle of the lower jaw by carefully examin-

\* See case of Mr. C., Atlas, page 2.

ing it as it moves before the external meatus; indeed, occasionally an obvious enlargement of this bone can be felt, or even seen beneath the zygoma, and in front of the ear.

#### ANATOMICAL CHARACTERS.

The anatomy of this disease as it affects the temporo-maxillary articulation, so far at least as the condition of the bones is concerned, seems now sufficiently well established. It would, however, be desirable that we were better acquainted with the state of the fibrous and synovial structures of the joint of the lower jaw in the earlier stages of this affection. It must be confessed that the amount of accurate knowledge which we possess on this last point is still deficient, as few opportunities have as yet been afforded to any anatomist to witness them; it may, however, be safely inferred from what we know of this same disease, when situated in the more superficial articulations (as in the knee), that in the first stage of this chronic arthritis, there must be some increased effusion of synovial fluid into the interior of the sac or sacs of the joint.

We cannot exactly tell in what stage the inter-articular cartilage is destroyed, allowing the surfaces of the bones to become exposed to the effects of mutual attrition, but we believe that in all cases of this disease, these occurrences, sooner or later, take place.

This disease in the articulation of the lower jaw,

produces effects analogous to those found in the other articulations when they have been visited by the same malady. Thus the bony surface of the cavity for the reception of the condyle or head of the bone is found occasionally extended, sometimes deeper or more excavated than natural; but it is worthy of observation, that although the fundus of the glenoid cavity may be thus excavated, it does not seem that any process of thinning or attenuation of the bone takes place. On the contrary, if we hold up between us and the light a specimen of a temporal bone, the glenoid cavity of which had been affected by this disease, we find that the fundus of this articular cavity is really thicker and less transparent than the sound one.

The condyle or articular head of the lower jaw, under the influence of this disease, assumes various forms; sometimes it is very much enlarged, and the neck which supports it is very much elongated. More frequently, on the contrary, this neck is shortened, and the head is depressed and flattened out, as it were "forced downwards by the action of some great pressure"\* (see Atlas, Plate IX., Fig. 10). Occasionally, as in Cruveilhier's case, the head is almost altogether removed. The inter-articular fibro-cartilage, as well as the cartilage of incrustation, has been usually observed to have been absorbed, and the porous surface of the bones to have been exposed, and to present a red colour.

\* Page 75, *ante*.

When describing the anatomical characters of this disease, as they present themselves in all the articulations, I have observed that *eburnation* of the articular surfaces was an ordinary phenomenon, and that "foreign bodies" were occasionally to be found in the synovial sacs of all the joints. It would appear, however, that eburnation of the bony surfaces of the articulation of the lower jaw has as yet been seldom observed. Professor Smith, in commenting on his specimens, says he had only in one instance seen anything like porcellaneous deposit on these surfaces. In looking over the valuable collection contained in the Museum of St. Bartholomew's Hospital, I observed an example of this eburnation in one of the temporo-maxillary articulations, which, I have no doubt, was the result of chronic rheumatic arthritis. The following is an abstract from the notice in the Catalogue of this preparation: "There has been disease in one of the articulations of the jaw, producing *absorption of the articular cartilage, with a deposit of bone on the circumference of the glenoid cavity*. The corresponding condyle is in part removed by absorption; its surface is rough, except in one point, where it is highly polished, and has an *ivory-like* texture," &c.\*

I am not aware that "foreign bodies" have been found within the synovial sac in any case in which the temporo-maxillary articulation had been affected with this disease, if I except one case which is al-

\* Catalogue, vol. I., p. 71, A. 87.



luded to by so old an authority as Baron Haller,\* which in my opinion was clearly a case of chronic rheumatic disease.

The Baron, in his "Elementa Physiologiæ," says that the articulation of the lower jaw, on account of the constant motion it is subjected to, in talking and eating, suffers much from the effects of attrition. In one old woman, he adds, I have not only found the inter-articular cartilage perforated, but at the same time the cartilaginous incrustation of the glenoid cavity was altogether removed from this place, and seemed to have been formed into twenty small bodies (glebular), which were found contained within the capsule of this articulation.† Although the correctness of the theory here given, as to the mode of formation of these small bodies alluded to, may well be questioned by the modern physiologist, still, in my opinion, the removal of the cartilage of incrustation, the disintegration of the inter-articular fibro-cartilage, and the numerous foreign bodies found contained within the capsular ligament of the lower jaw, all these seem to point out the disease in the case of the old woman mentioned by Haller to have been one of chronic rheumatic arthritis.

\* Haller's "Elementa Physiologiæ," vol. VI., page 9. An. 1764.

† Alluding to the inter-articular cartilage, Haller says: "Pertinet ad frictionem impediendam. Ob perpetuum enim in loquendo et edendo motum, hæc articulatio magnam adtritionem patitur, neque solum meniscum perforatum, sed omnino crustam cartilagineam ossis temporum in vetula detritam vidi, inque viginti fere glebular collectam quæ capsula articuli comprehendebantur."—Haller's *Elementa Physiologiæ*. *Loc. cit.*

## CHAPTER VIII.

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### THE DISEASE IN THE STERNO-CLAVICULAR AND ACROMIO-CLAVICULAR ARTICULATIONS.

THESE articulations being the centres to which are ultimately referred almost all the movements of the upper extremities, it may be readily supposed that they occasionally become liable to suffer (particularly in the labouring classes) from *over work*; under such circumstances one or both of the extremities of the clavicle enlarge, and, as they are superficially situated, the swelling soon becomes conspicuous, either on the superior margin of the sternum or the summit of the shoulder, or perhaps in both these situations at the same time. These swellings, or "nodosities," would seem, in many cases, to consist merely in an hypertrophied condition of the bone and other structures of the articulations of the clavicle. Under these circumstances they can scarcely be considered morbid in themselves; nevertheless, they seem to consist in a condition of things which, I have no doubt, frequently predisposes the joints to become secondarily affected with the chronic disease we are here

considering, and in this case we shall find that, to the enlargement above alluded to, there are super-added other symptoms; for example, the patient will complain of pain on motion, stiffness of the articulations after exercise, weakness of the upper extremity corresponding to the side of the affected clavicular joints; and, in short, all the ordinary symptoms of chronic rheumatic arthritis may make their appearance in these joints.

When it has commenced in an hypertrophy of the structures constituting the joints of the clavicle, I have in general observed it to assume the *local* form; on the other hand the disease is observed frequently to affect the clavicular joints on both sides of the body symmetrically; and when this is the case it will be found that the disease has a constitutional origin, and that many of the other articulations, besides those of the clavicle, are also similarly affected. It is to be observed, that one of the acromio-clavicular joints may be the seat of this disease without any implication of the neighbouring shoulder-joint, but that the latter is seldom affected (whether the disease be of the local or constitutional form) without the former being also drawn into the same morbid action.

#### DIAGNOSIS.

The enlargement of either the sterno or acromio-clavicular joint in certain cases, when the history of the case is involved in obscurity, may by possi-

bility be mistaken for a luxation of the clavicle, either at its sternal or acromial end, as the case may be. However, when the sternal end of the clavicle is luxated, it is thrown forward in advance of the sternum, and is approximated abnormally towards the median line. Moreover, this extremity of the clavicle will be found to be very moveable when luxated, a state of things which may be well contrasted with the unchangeable condition of the nodosity, or hard swelling of the sternal articulation of the clavicle, which exists when this joint is the seat of chronic rheumatic arthritis.

If the acromio-clavicular articulation be affected with this disease, it may, it is said, be mistaken for a luxation of the acromial end of the clavicle, but when chronic rheumatic arthritis is the cause of the symptoms, we notice that the hard swelling does not yield at all to pressure, that it remains habitually of the same size, and at the same level. On the contrary, if dislocation of the acromial end of the clavicle be the cause of the swelling, this will be found to vary with the position of the patient; for example, if we desire him to lie down in the horizontal position, as in bed, and then suddenly to rise up again into the sitting posture, in the former attitude the swelling partially disappears, to recur again, with its previous elevation above its normal level, in the latter or sitting posture. The diagnosis, then, between this disease and the ordinary dislocations the extremity of the

clavicle is liable to, does not appear difficult, even when the previous history of the case is unknown.

As these two articulations of the clavicle have such important relations to the movements of the upper extremity, as already mentioned, we can readily infer that when either joint is affected with chronic rheumatic arthritis, the functions of the upper extremity of the corresponding side must be greatly impaired. I may here mention that I had lately under my care, in the Richmond Hospital, a patient affected with this disease of the right acromio-clavicular joint, whose occupation, as butler, had made it necessary for him to exercise much his upper extremities in burnishing plate, and in lifting and carrying to and from the dinner-table heavy dishes. As in this case the disease of his right acromio-clavicular articulation increased, he complained of pain on every motion, and of weakness of the upper extremity of the affected side, and at length he became so unable to perform the ordinary duties of a house servant, that at the age of 52 he felt compelled to give up his occupation altogether, and seek admission into hospital.

ANATOMICAL CHARACTERS OF THE DISEASE AS IT AFFECTS THE STERNO-CLAVICULAR AND ACROMIO-CLAVICULAR ARTICULATIONS.

When we remove the integuments covering the capsular ligament of the sterno-clavicular joint, in making the post-mortem examination of an indi-

vidual who had been affected by this disease in this articulation, we find that the fibrous capsule is remarkably strong and hypertrophied. The inter-articular cartilage is removed, as well as that of incrustation, which had invested the articular surfaces. The bones present a red appearance, and some red synovial fimbriæ are usually found to exist in some of the small recesses of the articulation. The sternal extremity of the clavicle is much enlarged, and the outline of its articulating surface is circumscribed with exuberant osseous granules, which form a corona round the bone. This articular surface is convex, and of an ovoidal shape. The posterior and inferior surface of it corresponds to the fossa formed for the clavicle on the superior margin of the sternum, and here the clavicle is sometimes found to present a point of eburnation.

I have had delineated from our collection in the Richmond Hospital Museum a specimen, which shows the ordinary effects of chronic rheumatic arthritis on both the sternal and acromial end of the clavicle (see Atlas, Plate ix., Figs. 2, 3, 4, 5). We also possess a cast in our collection, which well exhibits the external appearance the acromioclavicular joint presents, when affected by this disease (Atlas, Plate ix., Fig. 6).

Professor Smith laid before a meeting of the Pathological Society of Dublin some specimens, which were the result of chronic rheumatic arthritis of the articulation between the clavicle and acro-

mion process, together with the above-mentioned cast. In almost all the specimens the outer extremity of the clavicle was remarkably prominent, rising above the level of the acromion process. The articulating surfaces were greatly enlarged, the vertical diameter of that on the acromion being nearly three-quarters of an inch; they were destitute of cartilage. The articulation was surrounded with a capsule of great strength and thickness, and contained a plate of calcareous matter, and in the interior of the joint were a few foreign bodies. The inter-articular cartilage had disappeared. The external appearance of the joint resembled in some respects that of luxation of the outer end of the clavicle.\*

\* Reports of the Pathological Society, Dublin Journal.

## CHAPTER IX.

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### THE DISEASE IN THE SPINE.

THE articular surfaces by which the vertebræ of the spinal column are united to each other sometimes become affected by this disease, and it is in this case usually a constitutional malady. In some, the joints of the extremities are equally implicated with those of the spinal column, and then the condition of the patient is rendered truly miserable: he is incapable even of feeding himself, and becomes totally dependent on others. Dr. Robert Todd, of London, gives us the account of a patient of this class, a girl, aged 25, who was an inmate of the Wadsworth Union Workhouse; she was a complete martyr to this chronic rheumatic affection in all her joints, even in those of the *cervical vertebræ*. She was so crippled that it was found necessary to construct machinery in order that she might be lifted out of bed.\*

The patient afflicted with this disease in the spine, complains of stiffness in his neck, back, and

\* See Todd on Gout, &c., page 180.



loins, of rheumatic pains, increased by every change in the weather. If the *cervical* vertebræ be the seat of the affection, a crackling noise is heard on motion, verifying the remark made by the earliest observer of this disease, Haygarth, who says: "In a few patients a crackling noise is perceived on motion, particularly in the neck." The rotatory movement of the first vertebra on the second, permitting the patient to turn his face from side to side, is usually preserved, while the rest of the cervical region seems stiff and rigid. When the *lumbar region* is affected, the power of extension of the spine, or even of standing completely erect, becomes difficult. When the *dorsal* vertebræ are the seat of this disease, the back is rendered much more convex posteriorly than natural, the chest seems sunk in, and the figure becomes not only stooped and bent forwards, but an absolute diminution of the length of the spinal column and of the height of the patient has been observed to have taken place.

Some of the articulations of the lower limbs in these cases may be so far affected, that the patient's powers of progression may be greatly impaired, or even prevented altogether; but I would here wish to be understood to say, that there is really nothing in the affection of the spinal column itself, or in its joints, calculated to prevent the patient moving slowly about. We have never known the proper functions of the spinal marrow to be interfered with, nor paralysis nor paraplegia to occur. Vi-

bratory motions of the column, or jars, such as are produced by travelling in ordinary vehicles, do not so much incommode the patient as might be apprehended. Indeed, if we make the experiment, we shall find we can place the palm of the hand on the vertex of the patient's head, firmly press down, and even give a species of succussion in the longitudinal direction to the whole spinal column in these cases, and yet this force, thus applied, while the patient is either sitting or standing, shall not cause him pain. We may here remark, that by such an experiment as this last, we can readily distinguish this disease from articular caries of the vertebræ, with which it might by possibility be confounded, for we know that a patient threatened with articular caries of the vertebræ will shrink back from permitting the slightest pressure being made in the direction of the axis of the spinal column, much less will he allow any jar or shock to be communicated to it.

ANATOMICAL CHARACTERS OF THIS DISEASE AS IT  
AFFECTS THE VERTEBRÆ.

Our experience corresponds with that of Mr. Canton and Professor Smith, that the traces this disease leaves in the structures which compose the spinal column are more frequently found in the cervical and lumbar than in the dorsal region of the spine ; in short, we find that those portions of the spinal column, which in the normal state enjoy most mo-

tion, are those which are most liable to this disease, and hence it is that our museums will be found to contain more specimens of the lumbar vertebræ thus diseased than of the dorsal, and most of all of the cervical. We may, moreover, observe that the atlas and dentata have more free motions on each other than any of the other vertebræ enjoy, a circumstance which may account for the observation, that we are accustomed to see more numerous specimens of the effects of chronic rheumatic arthritis on these vertebræ than on all the others of the spine taken collectively.

Professor R. W. Smith made a communication, which has not been published, to the Pathological Society of Dublin, with a view, he stated, to record



FIG. 24.

Atlas viewed from behind; the spinous process removed to exhibit the enlarged articular facet A, which had corresponded to the front of the odontoid process. B B superior articular process. C C inferior articular process.

some facts he had collected to illustrate the pathological anatomy of this disease as it affects the bony structure of the spinal column; he specially called attention to its effects on the surfaces of articulation between the atlas and dentata or second

vertebra, and exhibited some specimens showing that the small and plane articular facet on the atlas, formed for contact with the anterior portion of the odontoid process of the second vertebra, was much increased in size, and converted into a deeply concave oval fossa (A, A, Fig. 24).

From the upper margin of this little articular surface, a bony process has been observed to grow and turn backwards, so as partially to overlap the odontoid process.

The Professor produced six specimens in which this disease had left its traces on the *second vertebra*, more especially on the odontoid process ; this,



FIG. 25.

The second vertebra viewed from before; atlas removed; odontoid process much hypertrophied.

at its basis, where it is connected with the body of the second vertebra, was rendered perfectly cylindrical, polished all round, and eburnated from the effects of the rotatory action of the first vertebra on the second. The odontoid process was also, in most of these six specimens, much hyper-

trophied, and prolonged upwards for half an inch above its ordinary level, towards the foramen magnum.

It was also shown that the articular processes of all the vertebræ became affected by this disease. In one specimen the inferior oblique process of the right side of the first vertebra was so much enlarged as to encroach somewhat inwards on the spinal canal, and outwards on the foramen for the vertebral artery (see Fig. 26). (It is not known

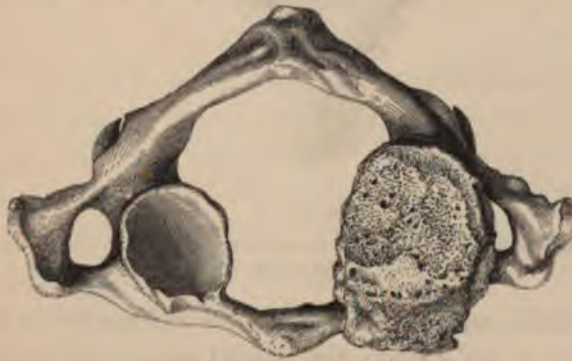


FIG. 26.

Atlas viewed from below.

that any symptoms which might be supposed referrible to such a state of things have ever been observed.) In a second specimen presented by the Professor, the superior articular process of the right side of the second cervical vertebra was so much enlarged that it equalled in circumference that of a shilling; all cartilage of incrustation had been removed from its surface, which presented in part a polished and in part a porous appearance;

this oblique articular process was surrounded with a rim of bone, B, Fig. 27, and had extended itself



FIG. 27.

Second vertebra viewed from above; A, odontoid process; B, superior articular process; C, spinous process.

outwards, and even so much posteriorly as to encroach a little upon the spinal canal, but at the same time not to the extent in any way to interfere with the medulla spinalis.

As to the *dorsal* and lumbar vertebræ, analogous changes to those here noticed in the cervical vertebræ have been observed; the cartilage is replaced by the ivory-like deposit on the articular surface of the oblique processes. This surface we find grooved vertically in the line of motion of these oblique processes, as they glide upwards and downwards on each other in the motions of flexion and extension of the spinal column.

## CHAPTER X.

### NATURE AND TREATMENT OF CHRONIC RHEUMATIC ARTHRITIS.

IN considering the nature of this disease, as well as the treatment of it, we should bear in mind that it may make its appearance in one articulation only—as, for example, in that of the hip or shoulder, as a *local* disease; or, on the contrary, it may, as a *constitutional* affection, engage many of the articulations simultaneously. In either of these forms we have, I am persuaded, to contend against an inflammatory or a sub-inflammatory condition of the affected joints. The inflammatory nature, however, of the disease is not universally admitted. The late Dr. Colles, who had paid much attention to the study of this disease, was known to have called in question its inflammatory nature. In making a communication to the Pathological Society here, he said, in reference to this affection, that “he did not think that genuine inflammation had anything to do with its origin, for nothing like pus or lymph had ever been found in the affected joints.” “If it

be inflammation," he adds, "it has not the characters or consequence of true inflammatory action."\*

The late Dr. Robert Todd would refer the phenomena this disease presents rather to *irritation* than to chronic inflammation, and concludes by saying that it no doubt presents certain points of *resemblance* to chronic inflammation, but that he considers the term *chronic rheumatism of the joints* less objectionable than chronic rheumatic arthritis proposed by Mr. Adams.†

On the other hand, we find that many consider the disease to be of a sub-inflammatory nature. For example, although Haygarth has not formally expressed any opinion on this question, yet we can reasonably infer that he considered the disease to be one of a chronic inflammatory character, from the treatment he advised.

Cruveilhier says: "This disease is one of the most serious and constant of the effects of inflammation, be it acute or chronic, of the synovial membranes. This affection continues, although the cause on which it may have depended may have ceased." He adds, that in all cases of this disease, where we have an opportunity of making an early post-mortem examination, we find unequivocal signs of inflammation of the synovial membrane, characterized by great development and redness of the synovial fimbri, and destruction of the cartilage.

\* See Dublin Journal, First Series, vol. xv., p. 498.

† Todd on Gout, &c. London, 1843.



In another place he designates the disease as "une inflammation chronique de la synoviale."

Sir Benjamin Brodie says: "In this disease inflammation of the synovial membrane is the first of a series of changes which the joint undergoes, and which in the course of years ends in its entire disorganization." Again he says: "Although opportunities of examining the pathological condition of the joints, which are affected in this manner, are *only of occasional occurrence*, there is no surgeon of much experience who has not seen many cases of the same disease in the living person, or who, having seen them, will not assent to the correctness of the observation which I have already made, that *inflammation* of the synovial membrane is the *first* of a series of changes which the joint undergoes. This is clearly indicated by the symptoms."

Indeed, if we look to the ordinary causes of this disease, we shall find them to be just such as we might suspect would be most likely to give rise to a disease of an inflammatory nature. For example, accidents, such as sprains and concussions of the articular surfaces, have been known to give rise to this chronic disease as a local affection, and its constitutional form has appeared, in numerous instances, to have been the result of rheumatic fever, and occasionally, too, of puerperal arthritis, the inflammatory nature of which diseases cannot well be questioned. Finally, let us look to the phenomena which chronic rheumatic arthritis presents, when it appears in a large and superficial joint, as,

for example, the knee in the living patient. Here we perceive swelling, and heat, and we learn that the patient is suffering pain, and if redness, one of the essential signs of inflammation already mentioned be not visible externally, yet, whenever an opportunity has occurred of making a post-mortem examination, so as to expose to view the interior of one of these affected articulations, we have invariably found in the redness of the synovial membrane and fimbriæ, and in the inordinate effusion of synovial fluid, as well as in the hyperemic condition of the bones themselves, very decided evidences of previous inflammatory action having existed.

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Haygarth, who first called the attention of the profession to this disease, thought it necessary to apologise for the scantiness of the information he had to communicate to the profession and the public upon the subject of its treatment.

“As it has not hitherto claimed the particular attention of medical men, we cannot,” he says, “reasonably expect that a full trial should have been made of remedies best adapted to remove or alleviate its symptoms.” To which the modern physician has to add, that, although for the last few years strenuous and successful efforts have been made to put the profession in possession of its anatomical characters and symptoms, it is to be la-

mented that the knowledge thus attained does not appear well calculated to remove our doubts that we shall ever be able to suggest effectual means of curing this disease, when once fully established ; because we find that the articular structures soon become altered or removed by it ; and we are not aware of any powers existing in the constitution capable of *reproducing* the delicate articular structures, such as cartilage, fibro-cartilage, &c., which have been removed. In the commencement, however, of the disease, it is to be presumed that a treatment suggested, not only by the symptoms, but by what we *now* know to be the true pathological anatomy of the malady at this period, may be attended with advantage ; and, even in many cases, which we regret to be obliged to admit are incurable, the consideration as to what are the best means of palliating the sufferings of the patient is well worthy of our deepest and most persevering attention.

When we inquire into the history of the treatment this chronic disease has hitherto been subjected to, we find Haygarth, the oldest authority, thus expressing himself : “ As far as my experience “ extends, much benefit was derived from the warm “ bath, and a stream of warm water, with the re- “ peated application of leeches on the diseased “ joints ; in several very bad cases these remedies “ afforded manifest relief.” In one case (this author says) of an adult female, “ the nodes of the fingers “ and knees commenced, and had continued for

“four years, with tumours, which occasioned an  
“apparent distortion of the joints, and considerably  
“impeded their motion. This patient received  
“manifest advantages from the warm bath, pump-  
“ing the diseased joints, and repeated application  
“of leeches to them.”

Sir Benjamin Brodie has made the following observations on the treatment of this disease, he says :  
“In the very commencement of this disease, before any actual disorganization takes place, and while the joints affected are limited in number, I believe much may be done towards preventing its further progress. The patient should be placed on a careful system of diet, partaking very moderately of animal food, avoiding fruits, acids, raw vegetables, and sugar, and taking little or no fermented or spirituous liquors ; he should take exercise daily, so as to *induce perspiration* :” and adds his opinion that little is to be done by local application ; but, that if there be more than usual pain in the joints, leeches may be applied, as Haygarth before recommended, and on special occasions a bandage, not for the purpose of making pressure, but of limiting motion. “Iodide of potassium,” he adds, “has the reputation of being useful in cases of this description, and,” he believes, “its reputation is not wholly undeserved. It should be given in small doses of two or three grains, twice daily, but should be continued, if it agree with the patient, for several weeks at a time.”

In one case, in which the patient was affected

with this disease (rheumatic gout), in a very aggravated form, so many joints being affected that the patient lay almost helpless on a sofa, and various methods of treatment having been already employed, to no purpose ; having learned that cod liver oil had been formerly supposed to be useful in some forms of rheumatism, Sir B. Brodie says he was tempted to prescribe this remedy for her. The purified oil was administered internally, and at the same time rubbed in as a liniment on the affected joints. It was a mere experiment, but there is certainly great reason to believe that it was not altogether unsuccessful. Not only did the disease cease to make progress, but when he last saw the patient, after she had taken and rubbed in the oil, with occasional intermission, during the period of seven or eight months, there was a distinct and manifest improvement in all the symptoms ; indeed, the result was such, that in any other patient, under the same combination of circumstances, Sir B. Brodie says he should certainly be disposed to recommend a trial of the same remedy.

It is no doubt to this disease that Sir Thomas Watson, Bart., in his lectures, alludes when he says, it frequently involves and cripples the smaller joints, especially those of the knuckles and fingers, rendering them knobby and distorting their form and position : the fingers take a permanently oblique position, slanting outwards towards the ulna ; and Dr. William Budd has drawn attention to the curious fact that the corresponding joints of

the two sides of the body are always affected exactly in the same manner—to use a paradoxical expression, the deformity is symmetrical—one crooked joint is just the copy of its fellow. Surely this indicates the constitutional origin of this disorder.

“Persons who are most troubled with this wearing complaint, and who can afford to live where they please, would do well to take up their residence in a warm climate. Wherever they may be, such patients should be protected against atmospheric vicissitudes by warm clothing; they should be cased in flannel from the neck downwards; warm baths are of great service, and especially baths of salt water of a temperature not less than a hundred; they may act as a stimulus to the cutaneous circulation. Warm douches, the vapour bath, and the hot-air bath, of which, as I said before, the patient may receive the benefit as he lies in bed; and to warm clothing and warm bathing may be added friction with some stimulating liniments, and what is called shampooing: it is in these cases that stimulating internal medicine is often of use—turpentine, some of the animal oils, the cod liver oil, guaiacum: opiates, too, are frequently remedial of the pain; and there can be no better form of the administration than that presented to us in the celebrated Dover’s powders—the Pulv. Ipecacuanhæ Comp. of the Pharmacopœia—.”

Drs. Fuller and Garrod, two eminent London physicians, have in their respective works on gout, &c. &c., each devoted one chapter to rheumatic

gout, a disease they look upon, as Haygarth and I have done, as a malady "sui generis," or as Haygarth has well expressed it, "as a painful "and troublesome disease of the joints, of a peculiar "nature, and clearly distinguishable from all others, "by symptoms manifestly different from gout, and "from both acute and chronic rheumatism."

Both these physicians, since the first publication of this treatise, 1857, have each produced new\* editions of their works on Gout and Rheumatism, including special remarks on rheumatic gout; and before I refer to their valuable observations as to the medical treatment of this last disease, I feel it proper to advert to some of their opinions and doctrines relative to the nature of the disease in question, with many of which I entirely concur. For example, Dr. Fuller says that rheumatic gout is not a mere variety of gout or rheumatism, nor is it a compound of the two diseases; but, on the contrary, he considers that it is essentially distinct from both, and has a special pathology of its own, and requires a distinctive title. The claims, however, of rheumatic gout to be thus considered a *distinct* disease, uncomplicated with any other, might perhaps, in the opinion of some, be called in question, from the examples adduced by Sir Benjamin Brodie of rheumatic gout (as he considered them), attended with *cretaceous* deposits, as well as from the case I shall presently advert to, which was laid before the

\* Fuller, 1860; Garrod, 1863.

Pathological Society of Dublin, by my friend Dr. Bennett, University Anatomist.

In one of Sir B. Brodie's cases, quoted to illustrate rheumatic gout (Case LIII.), he states, that an old lady who had suffered in an unusual degree from *gout*, during the greater part of her life, was supposed at last to labour under organic disease of the stomach, of which she died. We must refer to Sir Benjamin Brodie's work\* for full details of the case, which appears evidently brought forward to illustrate rheumatic gout; yet, in the commencement of the report made of it, it is stated that the case was that of a lady who suffered in an unusual degree from *gout*; and on making the post-mortem examination of it, the evidences of true gout were well seen in the report made of the dissection, in which we find it mentioned that "in various parts of the body there were orifices in the skin communicating with membranous cysts situated in the adipose substance, and discharging a *chalky* fluid." There were no remains of the cartilages in the left knee; the corresponding parts of the patella and condyles of the femur had the appearance of having been worn into grooves and ridges, &c.; a thin layer of white *chalk-like* matter had been deposited on the bones where the cartilage had disappeared in several places, &c. In a second example, Sir Benjamin Brodie refers to a preparation in the Pathological Museum of St. George's Hospital, exhibiting

\* Brodie on the Joints, Edition 1865, page 274.



the condyles of the femur incrustated with a gouty concretion (lithate of soda), taken from a patient, of whose case the following is a brief history :—

“A man, 52 years of age, (Case LIV.) was admitted into the Hospital, who had long laboured under a disease which had been *considered as rheumatic gout.*” Some time after his admission he was seized with erysipelas of the head, followed by diffuse inflammation of the submucous laryngeal cellular tissue, of which he died.

On examining one of the knee-joints, the synovial membrane was found much thickened and vascular. The cavity of the synovial membrane was filled with a large quantity of a thick white fluid, which proved to be a mixture of lithate of soda and pus. In some parts the cartilages had disappeared, and the exposed surface of bone was covered by a thin layer of the *lithate of soda.* Where the cartilages remained they were incrustated in the same manner. There were deposits of the same gouty concretion in cysts of the cellular membrane external to the joint.

Notwithstanding the usual care with which Sir Benjamin Brodie's cases are recorded, in reading those two above mentioned, which he has denominated in his edition, 1850, cases of chronic *gouty* disease of the joints, and in the later posthumous edition, 1865, are denominated “Diseases of the Joints, connected with a Gouty Diathesis,” we must, I think, consider that such examples cannot well be considered as true illustrations of the ana-

tomical characters of chronic rheumatic arthritis. I agree with those who consider chronic rheumatic arthritis as a very different disease from gout, and that the former, to use Dr. Fuller's words, has a distinctive pathology of its own.

The Case (LIII.) Sir Benjamin Brodie has brought forward, under the head of a disease of the joints, connected with the gouty diathesis, would seem to have exhibited, when the autopsy of it was made, more of gout than of chronic rheumatic arthritis, for there were found cysts discharging a *chalky* fluid, which is not surprising, as it is stated that the lady had gout.\*

In Case LIV., it is mentioned that the patient laboured under a disease which we are informed had been *considered* "rheumatic gout," and we read that, on making the post-mortem examination in this Case (LIV.) the cavity of the synovial membrane of the knee was filled up with a large quantity of a thick white fluid, which proved to be composed of lithate of soda and pus.

The account of such cases as these might, in my view of the matter, give us an idea of the anatomical characters of true gout, but by no means of those of chronic rheumatic arthritis. \*

Let me not, however, be understood to deny that lithate of soda may be found in some rare cases coating the articular surfaces of the bones of individuals who had been during life affected with

\* Edition 1865, Vol. \*ii., page 274.

chronic rheumatic arthritis, and whose joints presented, after death, not only the well-known anatomical characters of this disease, but at the same time those of true gout.

Under such a circumstance, I would at once come to the conclusion, that the individual in whom such a combination of things existed had, during life, been at one time subjected to attacks of true gout, and at another to those of rheumatic gout. Under such a category I would place the rare case laid before the Pathological Society, already alluded to, and which may be referred to as follows :—

Dr. Bennett, University Anatomist, stated to the meeting of the Society, held January 28, 1863, that he wished to lay before it some specimens of diseased joints found in the body of an aged man, brought into the School of Medicine, in Trinity College, for dissection. As to the history of the case during life nothing was known ; but there could be no doubt as to the nature of the two diseases from which the man had suffered. On referring to most of the joints, Dr. Bennett had found abundant evidence of chronic rheumatic arthritis having existed in them. The heads of both the right and left humerus, for example, had been altered in form in the usual way that they are in cases of chronic rheumatic arthritis of the shoulder, and the articular surfaces presented the characteristic ivory-like polish. In short, abundant evidence of the results of chronic rheumatic arthritis existed in many of the joints. In prosecuting the examination

further, Dr. Bennett remarked, that there was to be seen equal anatomical evidence of true gout having, at one time or another, existed in some of the articulations. He observed that the joints of the lower extremity exhibited to the Society were incrustated with a white deposit over a great part of their surface; it extended for some depth into the substance of the cartilage, so that it could not be removed without injury to the latter, &c., &c.

He further added, that on testing the deposit, by placing on it a drop of strong nitric acid, and after a few moments holding the moistened surface over the fumes of strong liquor ammoniæ, the reaction characteristic of lithic acid occurs, and the colour of the deposit is changed to a light orange scarlet; the microscopical examination of the vertical section of the cartilage, through the deposit, shows that the latter is composed of minute acicular crystals of lithate of soda. From these facts, it is evident that the depositions in this case were caused by gouty inflammation.

Dr. Bennett added, that in this same subject the trochlea of the astragalus presented a very different appearance on its outer edge. Here the gouty deposit, the cartilage, and a portion of the bone itself were, as it were, cut off, and replaced by the well-known porcellaneous deposit of chronic rheumatic arthritis. The extent of surface thus affected is but small, but it is quite characteristic.

The interesting specimen thus showing the anatomical characters of chronic rheumatic arthritis

and of true gout in the same articulations are preserved in the Anatomical Museum of the University, Trinity College, Dublin.

Dr. Bennett, in making this communication to the Pathological Society, stated that Dr. Adams, in his work on Chronic Rheumatic Arthritis, observes, "We have not here, on making our post-mortem examination of cases of the disease in question, found any evidence of true gout having existed; no cretaceous deposits have been observed in the bursæ, nor in the neighbourhood of the diseased joints, nor any deposit of lithate of soda on their articular surfaces;" by which observations I referred only to my own experience up to the time I was then writing (1856); and although I have, since the period of the publication of these observations, pursued very actively the subject of my anatomical investigations as to this disease, still I must say, that I have not yet seen any specimen, except that one produced by Dr. Bennett, tending to show that the anatomical characters of true gout and of chronic rheumatic arthritis may be found in the same subject and in the same articulations. From Dr. Bennett's specimens it may, I think, be inferred, that the individual from whom they were taken had been, at one period of his life, affected with chronic rheumatic arthritis, and at another with true gout.

Dr. Fuller, in speaking of the distinctive characters of the two diseases under consideration, expresses his opinion that it is possible for a gouty

tendency to be engrafted on an *old rheumatic gout* disposition, or for a *rheumatic gout* tendency to arise in a gouty habit; and he says he has come to the conclusion that, in such cases, which are *very rare*, the disease has been at one time rheumatic gout, at another, more strictly gouty in its nature; and that the different results observed after death have arisen from the prevalence of each form of the disease at different periods of the patient's lifetime.

In reviewing here the observations of Dr. Fuller on rheumatic gout, I find he is in favour of the term rheumatic gout, as it points, he says, to the class of diseases with which the malady in question is closely allied, and is at the same time sufficiently distinctive, and cannot be confounded with either gout or rheumatism. It has, he says, the great advantage of having been already recognized and extensively used; and Dr. Fuller further adds, that even Dr. Garrod has adopted the term rheumatic gout as the title of his book. He considered it a most appropriate title, and hopes the profession will concur in limiting its application to the disease under consideration.

I am happy to be able to say that my experience agrees with Dr. Fuller's, that this disease is unaccompanied in its course by the "frightful heart disease," which proves so fatal in acute rheumatism; but I must add, that I cannot endorse his opinions that inflammation of the eyes, the brain, and the pleura, are to be looked on as the ordinary attendants on rheumatic gout. If I considered

rheumatic gout to be a disease which would invade the brain, the eye, or the pleura, I should certainly no longer retain the term arthritis as applicable to it; and, with Dr. Fuller's views, I do not at all wonder at his objections to the title chronic rheumatic arthritis being adopted as a designation of the nature of the disease in question. I retain the term arthritis, signifying an inflammation of a joint; because, as I have before stated, I believe, with Cruveilhier, that rheumatic gout is, at the first at least, "*une inflammation de la synoviale*;" and with Sir Benjamin Brodie, that in this disease inflammation of the synovial membrane is the first of a series of changes which the joint undergoes, which in the course of years ends in its entire disorganization.

Dr. Fuller speaks of the *acute*, or, as he denominates it, "the terrible form" of rheumatic gout; but in my experience I have found the affection to have been essentially chronic, or sub-acute. No doubt, I have seen, on some few occasions, the patient labouring under rheumatic gout to be visited with exacerbations of the disease, which might have lasted for one or two days; but such examples cannot, in my judgment, be properly considered as attacks of rheumatic gout in its acute and apparently terrible form.

It will be generally admitted, that in the treatment of this complaint we shall have usually to contend with a very obstinate *chronic disease of the joints*, and of a sub-inflammatory character. Hence,

we need not be surprised to find that most of the older and modern authorities recommend, for the treatment of it, some form of local depletion of blood, by the means of leeches, or otherwise. We have already referred to this practice as recommended by Haygarth and Brodie ; and we find Dr. Fuller saying " that half a dozen leeches should be applied for several successive days ;" and he gives this recommendation, fully aware as he is of the anemic condition in which many of the victims of this disease are to be found.

When considering the question as to the propriety or necessity of local depletions in the treatment of this disease, recommended by the authorities mentioned, we must take into account many circumstances—the age and temperament of the patient, the stage of the disease in the case, and as to whether it can be classed as of the local or constitutional form.

Let me take for example a very common case of chronic rheumatic arthritis, viz., that of the hip-joint: in such a case the disease is in general very nearly a local affection ; the patient we frequently observe to have a very vigorous frame, a ruddy and healthy appearance, and in such a case, when we are consulted in the earlier stages of the affection, we shall find that by taking away some blood locally, by the means of the scarificator and cupping glasses (an operation which causes but little pain or inconvenience to the patient), the local complaint in the joint may be checked as to



its progress, and the disease rendered more amenable to ulterior measures.

In many other cases, however, where, instead of one joint, many are simultaneously engaged, and when this disease is of the constitutional form, local depletions in the mildest shape can be expected to do no more than act as temporary palliatives of pain, and must be made only with due regard to the frequently feeble state of the general system of the patient. But, for my part, I will say, that I have seen advantage result from this practice of local depletion even in cases of patients with pallid looks and thready pulses, and in whom the local pains were not palliated until the local depletion alluded to had been resorted to. It will be recollected by my colleagues, and the clinical class attending the Richmond Hospital this session, that there were several cases of the above description of patients affected with chronic rheumatic arthritis benefited by the treatment above alluded to.

As to the *medical* treatment Dr. Fuller considers suitable to patients affected with this disease, he thus expresses himself:—"It must have been within the experience of every medical man to meet with instances of rheumatic gout marked by extreme inactivity of the skin: the patients referred to suffer greatly from cold, and rarely, if ever, perspire, however warmly they may be clad—however active the exercise they take—however great the heat they may be subjected to. Such cases are always more than usually obstinate, and thoroughly intractable

to ordinary remedies:" now, in these cases, he says, *arsenic* will be useful ; not unfrequently, when the other remedies have failed, he tells us he had recourse to its assistance, and although in some instances it did not fully realize his expectations, "I have never," he adds, "had reason to regret its administration. Given immediately after meals, it rarely produces the slightest discomfort, and even when it does give rise to temporary nausea, all unpleasantness can be got rid of by suspending its administration, and then diminishing the dose."

As a medium dose, 10 drops of Fowler's solution of arsenic may be given in a wine-glassful of water, three times a day for three weeks from the date of its first exhibition.

From the marvellous effects Dr. Fuller observes he has witnessed as the result of its exhibition, he says he feels justified in stating that "no case of rheumatic gout can be regarded as incurable in which its influence has not been fairly tried."

In referring to Dr. Garrod's opinions as to the nature and the medical treatment of this disease, expressed in the last edition of his work, we find that he commences his observations by saying, that he considers the disease of rheumatic gout to be of an inflammatory nature, though peculiar in its character, and that in the *early* stages of the disease the question of the propriety of depletion naturally arises. As to the treatment of rheumatic gout, he says it must be confessed that in this department much is still to be achieved ; but at the same time

great good can even now be accomplished by the adoption of judicious means. In some instances he thinks a few leeches may be applied with advantage, and that moderate counter-irritation is of great service, such as painting the part with strong tincture of iodine, or the use of a blister : he adds, there are certain special remedies worthy of consideration, for example, guaiacum, which he believes is best given in the form of the *ammoniated tincture* of the resin, and this preparation may be made to sit easily on the stomach by being rubbed up with mucilage, and combined with the compound tincture of cardomoms, or some other aromatic. He agrees with Dr. Fuller in recommending Fowler's solution of arsenic, and with the writer, that rest should be enjoined at first in the commencement of the disease, with the hope of aiding thereby the subsidence of the inflammation ; but that when the effused synovial fluid has been absorbed, and the alteration of the joints has advanced so far as to forbid all idea of saving the more delicate structures, he is of opinion that under such circumstances a moderate amount of movement being permitted to the patient is not only not injurious, but beneficial, as it tends to prevent a rigid state of the articulations being established.

Among the medicines which have been found useful to patients affected with chronic rheumatic arthritis, sulphur should not be omitted. The form in which I have found it useful and readily taken is the Chelsea Pensioner electuary, of which

the formula I have used for many years is given below.\*

Elsewhere we shall have to refer to sulphur, as an ingredient of various springs, recommended as places of resort for those afflicted with rheumatism.

In considering what *local applications* may be found useful to patients affected with this disease, we should not omit to refer specially to the use of tincture of iodine: there can be no doubt that patients who suffer from a painful condition of nodosity of the fingers and toes are occasionally much relieved by having the affected parts painted with tincture of iodine.

Where the application of the iodine is not intended to act as a counter-irritant, and where vesication of the skin might be inconvenient, the plain tincture may be mixed with the Linimentum Camphoræ Compositum,† and the good effect of this application may be equally experienced. A liniment composed of hydriodate of potass dissolved in soap liniment, in the proportion of one drachm of the former to an ounce of the latter, may be with advantage rubbed into the integuments of the swollen articulations; and I may also add, that in

\* R. Gum. Guaiac. ʒi.  
Pulv. Rhei ʒii.  
Pulv. Chryst. Tartar.  
Flor. Sulph. ā ʒi.  
Pulveris Nucis Moschat.  
unius.

Mellis despumat. lb. i. M.

A teaspoonful night and morning.

† R. Tincturæ Iodinii ʒi.  
Linimenti Camphoræ  
Comp. ʒii.  
M. Ft. Linimentum.

several cases I have seen the ointment of the hydriodate of potass used with excellent effects.

In one case particularly, viz., that of Lady K——, who, although she became rather suddenly affected in her wrists, hands, and knees, with rheumatic gout, had the disease in a truly chronic form, unaccompanied with any fever, she used the hydriodate of potash ointment three times a day, most assiduously rubbing it well into the skin covering her knees, the joints of the wrist, and fingers. Her general health was quite unaffected, and although unable to walk, from the condition of her knee-joints, she had herself carried, by two servants, almost every evening, from her carriage into a box in the opera. I may here remark that she was all her life much devoted to music; yet such was the crippled condition of her hands and fingers, that she could not at all play her favourite instruments, the harp and pianoforte. This lady persevered for about six weeks using, as described, hydriodate of potass ointment as a local application to the affected joints, and took internally no other medicine than the decoction and the tincture of bark, which, with the carbonate of soda and lemon juice, were given in a state of effervescence.

Her recovery, after about two months, was nearly complete; the use of her knees, wrists, and hands was restored; so that after this severe attack of rheumatic gout had subsided she was able to walk without lameness, and to play on her favourite instruments with her usual unexampled skill and execution.

It is to be observed that this lady rubbed into the integuments covering the affected joints the ointment of the hydriodate of potass with unusual vigour and perseverance, and her recovery may be perhaps somewhat owing to the absorption of the iodine of the ointment into her system, as well as also to the effects of the bark, which was taken in full doses. As to her diet, she made no change from her ordinary system. I dwell on this case, as I have not seen this intractable form of chronic disease yield so soon, or so much, in any other case. Some characteristic deformity of the fingers alone remained.

Mr. Graham, of Westmoreland-street, saw this case of Lady K—— with me, and the medicines were supplied from his establishment.

We may sometimes find it expedient to treat a joint painfully affected with rheumatic gout, by enveloping the affected part in carded wool, which is then covered with oiled silk, whereby a profuse perspiration is produced and pain relieved, and the progress of disease arrested.

Anodyne liniments, as No. 1, as well as warm anodyne fomentations, as No. 2, should occasionally be had recourse to.\*

\* *Liniment No. 1.*

B. Linimenti Saponis ℥ii.  
Acid. Hydrocyanici ℥ii.  
Extract. Belladonnæ ℥ii.  
M. Ft. Linimentum.

Caution.—For external use only.

*Fomentation No. 2.*

B. Extract. Conii ;  
—— Opii aquosi,  
—— Belladonnæ, ā ℥i.  
Decoct. Papaver. alb. ℥xvi.  
M. Pro fomentatione.

In the early stages of chronic rheumatic arthritis, the synovial membrane of the affected joint often becomes much distended with fluid. This swelling is sometimes manifest enough when the shoulder-joint is the seat of the chronic inflammation which exists; but when the knee-joint is the seat of the affection, the existing fluctuating swelling, in consequence of the more superficial situation of this articulation, becomes much more conspicuous. We can also observe that in the case of the knee-joint being affected, besides the swelling of the articulation itself, enlarged bursæ are frequently seen around the joint, and some of these synovial sacs communicate freely with its interior (see Atlas, Plate 1x., Figs. 1 and 8). These synovial swellings usually, after a time, disappear; and indeed, in my opinion, should be considered rather as ordinary or passing symptoms of the disease, than as prominent features of it, requiring active surgical interference. We have often had occasion to observe that after the swelling had totally disappeared the disease was by no means alleviated, nor the lameness of the patient less; it appears to me, however, that medical men in general attach too much importance to the circumstance of this chronic *hydarthrosis* of the knee-joint continuing, and sometimes recommend that irritating injections should be thrown into the interior of the synovial cavity, with a view of curing the disease. In a word, they are of opinion that the *hydarthrosis* of the knee-joint should be treated on the same principle as a hy-

drocele of the tunica vaginalis testis, where a radical cure is sought for, and therefore, in cases of hydarthrosis of the knee we have heard of examples in which the accumulated synovial fluid having been first withdrawn, tincture of iodine has been forthwith injected into the synovial sac, with a view to produce new inflammation, in the hope that a radical cure may be the result; but notwithstanding the high authority upon which such practice has been recommended, I think I cannot too strongly condemn it. My ideas of the nature of chronic rheumatic arthritis, derived from observation of it in the living patient, as well as from post-mortem examinations of the disease, will always make me very unwilling to advise any opening whatever to be made into a large joint affected with this disease. Indeed I would place the operation of introducing a trochar into the distended synovial sac of a knee-joint affected with chronic rheumatic arthritis, to be followed by the withdrawal of the fluid and immediate introduction of an irritating injection, with a view of producing inflammation of the joint, in the same objectionable class as that of cutting out a foreign body from the knee-joint in any case where this foreign body is found to exist in a joint affected with rheumatic gout.

The cases just alluded to of chronic rheumatic arthritis of the knee with synovial effusion (and for the treatment of which hazardous operations we find have been proposed and put in practice), should in my opinion be managed simply as or-



dinary cases of chronic synovitis of the joint usually are.

Under the ordinary treatment, by moderate local depletion, &c., &c., the synovial swelling of the joint, or hydarthrosis, is generally observed gradually to subside; but, at the same time, we are quite ready to admit that we have in these cases frequently to notice that the knee-joint does not undergo, as to its capability of performing all its functions, a corresponding degree of real amelioration. The patient, whose knee joint had been in the morbid condition above mentioned, may be so far improved by time and treatment, as to be enabled, with assistance, to walk about; and if the exercise be only moderate, the joint may become somewhat freer in its motions. The patient may feel that he can stand on the limb without suffering, and complain only of weakness in the joint; and passive motion may be communicated to it, to a certain amount without causing pain—I say to a certain amount—for we invariably find in these cases that, when the degree of flexion of the limb is brought to a certain point, pain is complained of, and the flexion cannot be increased one degree more without causing present uneasiness, and without proving a source of subsequent aching of the joint. Under such circumstances it is easy to understand that, while the patient is daily walking about, with the aid of a stick only, he may, by incautious movements, occasionally sprain the joint,

and from such sources of irritation we too often have to notice recurrences of the chronic synovitis.

It is, no doubt, to cases of this kind that Sir Benjamin Brodie alludes, when he says, in speaking of the use of local appliances in the treatment of this disease, that, "on particular occasions a bandage, not for the purpose of making pressure, but of limiting motion, may be applied, and in some instances a light leathern splint, or pair of splints, may be employed with advantage."

First, then, with reference to the application of bandages, I may observe, that the medical man has seldom any occasion to suggest their use, for the patient, whether he be a private or hospital one, usually anticipates us, and we observe he habitually wears a flannel roller around the affected knee or knees. I am not surprised at this, because I notice that the patients affected with chronic rheumatic arthritis of the knee, in advanced cases generally complain of coldness and weakness of the joint more than of pain, and the employment of a flannel roller seems, as it were, instinctively to suggest itself to the mind of the patient.

With respect to the use of splints in the treatment of chronic rheumatic arthritis of the knee (which have much apparently to recommend them), all I have to say is, that I have seldom had much opportunity of fully testing their value, as I have not found them at all popular with patients, who will submit to the application of counter-irritants and liniments, and various kinds of douches ; but they

seem to dread the continued use of splints, as likely to induce permanent stiffness of the joint, of which they do not approve.

It is true that, in the treatment of chronic synovitis of the knee joint, whether it be of a specific nature or not, after the first symptoms have yielded, our first aim, as a general principle, should be to prevent this dreaded stiffness of the knee being established ; but, on the contrary, our desire should be to restore a certain degree of normal mobility to the affected articulation : passive motion is in these cases usually recommended, and exercise, which must be moderate ; but if, under such circumstances, the chronic disease of the joint does not improve, and if, in consequence of slight accidents, frequent recurrences of synovitis occur, then it may become a great desideratum that a stiff joint, or that a permanently rigid state of the knee may be established, in a good position for progression ; and such a desideratum cannot be better accomplished than by the patient using a pair of splints, or a light leathern gutter with straps in front. We must so far agree with the general views of the patients, that a stiff joint is, no doubt, an evil to be complained of ; but we feel assured that, on the other hand, the comparatively trifling drawback of a stiff knee-joint would seem amply compensated for by the freedom from the liability to sprains, and their consequences, which, in the unsupported state of the joint, it is liable to, and which sprains never can

occur when a stiff joint in a convenient position for progression has been established. But it must be confessed that, when both knee-joints are affected at the same time, there may be much difficulty in managing the case according to this plan.

The various joints, the subject of chronic rheumatic arthritis, it will be admitted, are found to be so differently affected by this disease, that it must be considered as a matter of much difficulty to lay down any general rule of treatment which can be made applicable to all cases. It would appear that Sir Benjamin Brodie, in alluding to the treatment of this disease, has been justified in saying, "After all, no general rule can be laid down as a guide for the practitioner on all occasions; each individual case forms a study in itself, not only for the medical attendant, but for the patient also."

As there is much variety in the symptoms, so must there also be variety in the treatment of this disease. And here let me observe, that there are two symptoms attendant on this disease, which, as they seem to me not to have been sufficiently dwelt on heretofore, I think it right to allude to here.

The first of these symptoms is denominated by Cruveilhier "*articular rigidity*." The second to which I would call attention, is rather a result of the disease than a symptom, which has not yet attracted any observations from the profession, except those which are contained in the former edition of this treatise—I mean an "*abnormal mobility*" of

the joints which have been affected with chronic rheumatic arthritis.

We shall first treat of articular rigidity, and secondly of abnormal mobility.

## CHAPTER XI.

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### NATURE AND TREATMENT OF "ARTICULAR RIGIDITY" OF JOINTS AFFECTED WITH CHRONIC RHEUMATIC ARTHRITIS.

ONE of the most constant symptoms attending on rheumatic gout is a remarkable stiffness and rigidity of the affected articulations and the surrounding muscles. This symptom, as elsewhere mentioned, is felt by the patient when, after the repose of the night, he first commences to move the joint or joints in the morning. On other occasions, as when having taken a long walk, and having rested for a time, he then re-commences to move about, pain and stiffness of the joints are again complained of; but such symptoms, under moderate exercise, gradually become less inconvenient. For example, we often observe patients, while otherwise in the vigour of life and health, affected with chronic rheumatic arthritis of the hip. When they first get up in the morning they move about with difficulty, and complain of an aching in and stiffness of the

hip-joint; but after a time they become, by degrees, freer in their movements. Though lame, they can walk many miles by day, and if only the exercise they take be moderate, and that they stop short of fatigue, they enjoy excellent rest by night.

This stiffness, which Cruveilhier calls "articular rigidity," is observed also in the articulations of the upper extremities, particularly in the elbows and wrist-joint.

There is another more painful, severe, and intractable form of articular rigidity, which is seen in advanced cases of rheumatic gout, where the disease seems to have taken possession of almost all the articulations of the frame. In these cases the upper extremities are equally affected with the lower (see case of Burgess, Fig. 28, &c.). The patient, when he first awakes in the morning, cannot, without assistance, turn himself in the bed; the articulation of the lower jaw is so stiff, that at first he cannot open his mouth sufficiently to take his ordinary nutriment; the upper extremities become rigid, the wrist joints seem specially affected, and if at the same time, as often happens in these cases, the cervical vertebræ become also implicated, the unhappy patient is unable to feed himself, and becomes totally dependent on others; and in consequence of the state of the lower extremities, which are often much distorted, as well as rigid, he is incapable of walking, or even standing erect, and ultimately becomes bed-ridden from the effects of the disease. In these

cases some little movement can be communicated to the joints, but not more than is just adequate to prove absolute ankylosis does not really exist. To flex or extend the joint beyond a very circumscribed limit is exceedingly painful to the patient. As to *the treatment*, we may in vain recommend passive movements and desire mechanical efforts to be also resorted to, gradually to extend or flex the limbs, but neither active nor passive movements can be endured by the patient, who sometimes complains even of the pressure and weight of the bed-clothes on the affected joints ; so that all that is often left to the medical attendant to prescribe, are opiates and other palliatives of pain ; and constitutional treatment, vapour and hot air baths, which the patient may take and get the benefit of, without being moved from his bed ; but we must confess that from the experience we have had of the intractable nature of these cases, and from what the post-mortem examinations of some such have revealed, we have but little hope of being able to accomplish more than to palliate somewhat the sufferings of these patients, the victims of this, the worst form we know of this disease.

Upon the subject of the *prognosis* we have to form, relative to the course of these cases, when the constitution seems so much implicated, all we have here to say is, that nothing can be more unpromising ; but upon this subject we have nothing to add to what we have already stated



in the earlier part of this work (see page 25) under the head of "Prognosis, &c."

As the symptoms of chronic rheumatic arthritis of the constitutional form seem to me not to be very familiarly known to the profession, it may not, perhaps, be considered superfluous to introduce here a striking example of this form of the disease in the case of a patient who was under my care during part of the last winter in the Richmond Hospital:—

#### CASE XVI.

CASE OF CHRONIC RHEUMATIC ARTHRITIS OF THE CONSTITUTIONAL FORM, WITH ARTICULAR RIGIDITY, ENGAGING ALMOST EVERY JOINT IN THE SYSTEM. THE DISEASE HAD COMMENCED AT THE EARLY AGE OF 13 YEARS.

Margaret Burgess, aged 27, was admitted into the Richmond Hospital, 27th. September, 1867. She is afflicted with chronic rheumatic arthritis, of the constitutional form, in almost all the articulations. She has a very sad expression of countenance, and the appearance of being much older than she really is; her whole person is greatly emaciated; she cannot walk, or even stand, such is the contracted condition of her knee-joints, which are swollen, but not from synovial effusion, but, as it were, from some subcutaneous infiltration, as in white swelling. She complains of much pain in almost all her joints, particularly at night; these pains are worse in rainy or frosty nights than at other times.

When we inquire into the history of her case, we learn that the disease came on her first, when she was only *thirteen years* of age. It began by her feeling pains in her feet and ankles, and without having anything whatever like rheumatic fever to precede them. The joints of the upper extremity next became successively and symmetrically affected. Her female health has been, since she was 16 years of age, perfectly regular, until about 12 months ago, when the catamenia ceased. When we inquire into the state of each of the joints in particular, we notice that the articulation of the lower jaw at the right side is much affected. She has difficulty in opening her mouth, particularly in the morning. Pressure over the *right* condyle of the lower jaw gives pain. She generally during the day remains sitting up in bed, her lower limbs placed horizontally before her, and her back supported by a bed-rest. She also sits up occasionally in a chair before the fire. The external appearance of the several joints we have endeavoured to have represented by the engraving (No. 28); her shoulders seem very much emaciated; indeed the scapular muscles are quite atrophied, and the bony processes of the acromion and spines of the scapulæ stand out very prominently. When we take hold of the humerus and attempt to rotate this bone on its long axis, we find it cannot be accomplished; the humerus can be abducted from the side, and, at the moment, there is no more movement observable in the shoulder-

joint than if it were really anchylosed; but that there is no bony anchylosis of the shoulder-joint is easily proved; for, if the scapula be grasped firmly by the hand of the surgeon when the movement of abduction is being made, it will be found that there is still motion in the shoulder-joint, and that the anchylosis was only apparent, not real. There is weakness and stiffness complained of in the shoulder-joint, but very little of pain. The elbow-joint cannot be fully extended nor fully flexed, and the radius at the elbow cannot be rotated. The wrist is rigid and painful to move; the fingers are characteristically affected; the small joints are knobby. She states that she has now more suffering in her feet and ankles than elsewhere; the feet seem much everted, and even the bones of the leg seem rotated outwards; the skin over any of the articulations is tender to the touch; she cannot even bear the weight of ordinary bed-clothes.\*

This unhappy patient remained in hospital until the 27th of October, when, at her own request, she was brought to her own home. I cannot say that we were enabled to be of any real service to her health while she was in hospital, nor could we promise her benefit by inducing her to remain in the institution; but there cannot be a doubt but that, even in her reduced and anemic state, the suffering in her feet and ankles was somewhat palliated by the

\* As my colleague, Dr. Fleming, knew I took much interest in the study of such cases as the above, he was kind enough to have her placed in one of my beds in the Richmond Hospital.

occasional application of a few leeches and anodyne fomentations and liniments ; but as to internal medicines, she took none except cod liver oil, and the usual anodyne pills (see Index, case of Cassidy).



FIG. 28.

Case of Margaret Burgess.

The above woodcut may give a true but melancholy notion of the external appearance that the constitutional form of chronic rheumatic arthritis

presents in cases where the patient's joints become much affected with articular rigidity.

That the reader may be further made acquainted with the symptoms and anatomical characters of this form of chronic rheumatic arthritis, to avoid the necessity of repetition, I must refer the reader to the details of the cases of Jane Cleary and J. M'Garry, the history of which may be found in pages 24 and 25 and Plate XI. of the Atlas; in which also are coloured lithographic drawings illustrating the recent *post-mortem* appearances usually seen in this form of the disease.

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## CHAPTER XII.

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### NATURE AND TREATMENT OF ABNORMAL MOBILITY OF JOINTS AFFECTED WITH CHRONIC RHEUMATIC ARTHRITIS.

IN strong contrast with the articular rigidity of joints which have been affected with the form of chronic rheumatic arthritis we have just adverted to, we have now to refer to an apposite condition of the articulations—the result of this disease—namely, an *abnormal mobility of these joints*.

I have in the foregoing pages of this work alluded to cases of abnormal mobility of joints as the result of chronic rheumatic arthritis, and adduced an example of this disease affecting the shoulder-joint, in which the head of the humerus was susceptible of abnormal movements, forwards and inwards, under the coracoid process (p. 115). “When the arm of the patient was grasped, and whenever slight force was used, the humerus could easily be made to descend somewhat, and at the same time to pass beneath the outer margin of the

coracoid process, and then the surgeon could easily sink his thumb into the outer half of the glenoid cavity, the space the head of the humerus had abandoned." When the shaft of the humerus was elevated vertically, the head of the bone could be made to strike against the under surface of the acromion. In this case, on making the *post mortem* examination of the joint, the capsular ligament, when exposed, was found to have superiorly very wide attachments; and, consequently, the space in which the head of the humerus had been permitted to move, was much more extensive than natural. If we refer to the anatomical characters of this disease of the shoulder-joint, as exemplified in the specimens of it to be found in our museums, and illustrated by the engravings in the Atlas (Plate II. ; Plate III. ; Plate IX., Fig. 7), we shall not, I imagine, be at a loss to account anatomically, for the extensive abnormal movements which may be communicated to the head of the humerus in the living, who have been long affected by this disease.

That the shoulder-joint, however, is not the only one susceptible of complete dislocation as the result of this chronic disease, the following example will fully testify:—

## CASE XVII.

CASE OF CHRONIC RHEUMATIC ARTHRITIS OF BOTH SHOULDER-JOINTS AND OF THE LEFT KNEE-JOINT, WITH ABNORMAL MOBILITY AND COMPLETE DISLOCATION OF THESE THREE ARTICULATIONS IN THE SAME PATIENT, THE RESULT OF CHRONIC RHEUMATIC ARTHRITIS.

J. Stafford, aged 59, appeared this morning, 10th February, 1868, at the Richmond Hospital, in which he had already been (eleven years ago) a patient affected with chronic rheumatic arthritis. Three of his large joints—namely, one of his knees and both shoulders—are now susceptible of complete dislocations, the result of this disease. When we stand before the patient and view his left shoulder-joint, we observe it to be much altered from its normal form; its appearance is very variable,—when the patient keeps his elbow to his side, the stump of the shoulder presents a rounded appearance, which is not due to muscular development, but to the existence in the interior of the shoulder-joint of a large quantity of synovial fluid. When he has raised his elbow from his side, we are at once struck with the abnormal appearance the arm presents: just where the deltoid muscle is inserted into the humerus, a remarkable angle is formed, the sinus, *B*, of which looks upwards and outwards, and exhibits just such an appearance as the humerus does when the head of this bone is dislocated from an accident into the axilla. The patient, as he moves his elbow



from his side, feels the rubbing of the bony surfaces on each other ; and if the surgeon introduce his fingers high up into the hollow of the axillary cavity, and at the same moment still further abduct the elbow from the side, the head of the humerus is plainly felt by the fingers to be really



FIG. 29.

Chronic rheumatic arthritis of the shoulder, with abnormal mobility of the joint.

dislocated into the axilla. If the elbow be first drawn backwards, and an impulse be given to the shaft forwards, then the head of the bone can be thrown very much towards the clavicle, and be

made to present a more obvious tumour in front under the pectoral muscle, than downwards into the axilla, exhibiting not only the semblance to, but the reality of the luxation forwards and inwards. When the head of the humerus is thus dislocated forwards, and rotation is communicated to the arm, a remarkable crepitation is perceived, while the head of the bone is felt to obey all the motions given to the shaft.

The region of the shoulder presents all this time to the view a sufficiently plump and rounded appearance, and, in this respect only, differs in its aspect from that which this region assumes when accidental luxation has occurred. In other words, the angular appearance of the shoulder, at the acromion, usual in accidental luxation, is absent; because the space beneath the acromion, abandoned by the head of the bone, is filled up with an inordinate quantity of synovial fluid, which distends the capsular ligament. As the patient can at will produce the dislocation in question, so also can he voluntarily, or by the exertion of the muscles of the shoulder alone, return the head of the bone back to the centre of the glenoid cavity; and, indeed, I believe the ordinary movements he has been in the habit of performing at his work, so far as the articulation of the left shoulder is concerned, consist altogether in the continual change of place of the head of the humerus from the glenoid cavity into the axilla, and back again from this space into its socket. The patient says that the shoulder-

joint feels remarkably loose, but that he can perform all the "under-hand" movements of the upper extremity perfectly.

When we take hold of the elbow of the patient, and pull the humerus downwards in the direction of its long axis, we find that the bone can be made to descend from the glenoid cavity for the extent of one inch; and when the elbow is drawn forwards, and the humerus then pushed backwards, the head of this bone can be dislocated on the dorsum of the scapula, and all these abnormal movements are the source of no pain whatever to the patient. The capsular ligament must be longer and wider than natural, or otherwise it never could admit of all this change of position of the head of the humerus.

*The Biceps.*—The *intra-articular* portion of the tendon of the biceps is in this instance, no doubt, as it ordinarily is in cases of this disease, atrophied; and in this circumstance we can find one of the reasons why the movements of the head of the humerus are but little restrained in the widened capsular ligament, and why the abnormal movements mentioned are permitted. Then, as to the *extra-articular* portion of the tendon of the muscle, this is seen to form an abnormal line, *b*, extending from beneath the fold of the pectoral muscle for two inches, before it reaches the upper margin of the belly of the biceps, which is smaller, shorter, and placed lower down than natural; and when, by the will of the patient, this muscle is thrown into action, it forms a pro-

minent rounded tumour, c, about the size of an orange. On these occasions, also, we notice, descending from the lowest part of the muscle, another prominent line, e, which appears to be the lower tendon of the biceps passing to its insertion into the radius.

*Right Shoulder-joint.*—When formerly admitted into this hospital, Stafford's right shoulder-joint was but slightly affected; still, it was then stated that this joint crepitated much on motion, and that he had pain at the point in this arm just about the insertion of the deltoid muscle; indeed, he stated that he had just such a sensation here as he formerly had in the *left* or deformed extremity, and he had a firm persuasion in his own mind that the same changes had commenced to take place in his right as had already proceeded to such an amount in the left shoulder-joint (see Fig. 29). On examining him now, on his second admission into the hospital (February, 1868) we found that the former anticipations of the patient have been too truly realized; that the head of the right humerus can now also be dislocated forwards and inwards with the greatest facility, and without causing any pain to the patient; that as to the external appearances and susceptibility of luxation, the right is *now* affected just as the left, though not to the same amount. In a word, the so-called symmetry, which is said to characterize the lesions of opposite joints affected with chronic rheumatic arthritis, may be said to prevail here, both shoulder-joints in

their abnormal conditions seem so nearly to resemble each other.

*The Left Knee-joint.*—What first attracts our observation is the great size of the patella, which measures nearly three inches transversely.

When we examined the other bones of the knee, we found that the head of the tibia was greatly expanded laterally, and that when we sank our fingers into the cavity of the joint we could detect foreign bodies in its interior.

Besides the alteration in form of the bones of the knee, we have to remark that the whole of this left lower extremity was shortened more than two inches. This was the necessary result of the ascent of the bones of the leg in front of the femur, constituting a true dislocation of the knee, a lesion which is now quite evident (Fig. 30).

Indeed, the ordinary signs of the dislocation of the lower extremity of the femur backwards and downwards (Fig. 30), while the bones of the leg and patella are drawn forwards and



FIG. 30.

Case of J. Stafford.

Dislocation of the condyles of the femur, B A, downwards and backwards to the popliteal space, and of the patella, C, with the bones of the leg upwards and forwards in front of the femur.

upwards in front of the femur, exist in the case under consideration, just as they do in the case of accidental luxation of the bones at the knee-joint, when the femur has passed downwards and backwards, and the bones of the leg have ascended.

#### PREVIOUS HISTORY.

As to the previous history of the case of J. Stafford, we were informed that he had enjoyed uninterrupted good health until about thirteen years ago, when he first became affected with fugitive pains in many of his joints; he stated that he never had rheumatic fever; but we could infer from his description that, when first attacked, he had occasional short feverish exacerbations of about three days' duration each. He added, that although from the very first moment the disease had commenced in the shoulder-joints, the deformity became progressive, and the power of fully elevating the arms to an horizontal level was impossible to him; he still could use his forearms freely, and work with his plane at his carpenter's bench, if only he were empowered to stand on his left limb.

The complete luxation of the left knee-joint, which we see in this case to have occurred as the result of chronic rheumatic arthritis, has now existed for some years; but the precise moment at which the dislocation actually took place could not be ascertained. All we could learn as to the origin of this lesion was, that the left knee-joint

was for three or four months much swollen from synovial effusion, which extended upwards in front of the thigh, and behind caused a prominency in the popliteal region, as in Plate IX., Fig. 1.

The knee was represented all this time (although some abnormal mobility existed, no luxation had yet occurred) as being very weak, and it was noticed, that whenever the patient attempted to throw the weight of his body on the left lower extremity, the limb bowed very much outwards at the knee.

When the patient walked, it was noted that the affected limb became bent outwards at the knee: on these occasions the whole limb seemed bowed into an arch, with the convexity outwards. The motions of the joint were unaccompanied with pain. The patient complained of much weakness of the knee, yet, when he exerted himself, he was able to walk about without using any support to the weakened limb; but he stated that one day when he was walking through the street, his left knee-joint suddenly gave way under him, as if from something having been broken within the articulation; that ever since this occurrence he had not been able to walk or stand without some support. It is worthy of remark that the affection of the joint which ultimately ended in so complete a dislocation as that just described (see Fig. 30), was always of a truly chronic character; and even when the sudden giving way of the knee announced that some rupture of the ligamentous structure within the joint had occurred, there was

no pain felt at the moment by the patient, nor did any increase of the swelling follow the occurrence.

#### OBSERVATIONS.

These remarkable lesions, thus shown to have affected both *shoulder-joints* and the *left knee-joint*, seem to call here for some further remarks: first, as to the *shoulder-joint*, and, secondly, as to the *knee-joint*.

*Shoulder-joint*.—Although those who have studied chronic rheumatic arthritis of the shoulder must necessarily be familiar with the ordinary anatomical characters the tendon of the biceps presents (Atlas, Plate III., Fig. 3) as the result of this disease, yet the external signs by which such a change is known in the living have not hitherto been noticed or described by any; and to me it would seem that the appearance the region of the biceps presents in this case of Stafford gives us a good illustration of the *external signs* which are to be expected, when the intra-articular portion of the tendon of the biceps has been removed as the result of chronic rheumatic arthritis. The peculiarity of appearance represented by the belly of the biceps muscle (see Fig. 2, c) depends, no doubt, on this muscle not having its normal origin from the glenoid cavity of the scapula, but from the humerus, at the summit of the bicipital groove, which is some inches lower down; and it may be in obedience



to a law of the animal economy, that the fleshy part of the muscle should have above it a certain length of tendon, to enable it to perform its functions. I have seen a similar appearance as to the tendon and fleshy belly of this muscle in a case of bony ankylosis of the shoulder-joint, in which, so far as the biceps was concerned, an analogous state of things existed.

As to this shoulder-joint of Stafford (if it be permitted to us further to speculate on the actual condition of it in a living patient), I would say that I believe that the glenoid cavity is greatly enlarged; that the capsular ligament has a wide attachment to the coracoid process, and to the anterior margin of the coraco-acromial vault; that the condition called *hydrops articuli* of the synovial sac exists; that the intra-articular portion of the tendon of the biceps is atrophied, and that thus the head of the bone moves freely unrestrained in an over-stretched and widened capsule.

I may here observe that there is a preparation of a shoulder-joint in the museum of the Royal College of Surgeons in Ireland, which some years ago I considered so remarkable, and such a good illustration of chronic rheumatic arthritis, as it affected in an advanced stage the shoulder-joint, that I procured a lithographic engraving of it, which I have placed in the Atlas (Plate II.) belonging to this work.

Although in the Catalogue\* of the Museum this preparation is noticed simply *as a chronic disease*

\* Catalogue, Dublin, 1840, p. 397.

of the shoulder, I must claim the specimen as a most valuable illustration of the anatomical characters of chronic rheumatic arthritis of long standing.

The history of the case is unknown, but the appearances, however, cannot be misinterpreted by any one who has studied anatomically the effects of chronic rheumatic arthritis on the articular textures of the shoulder. If we look to the bones composing the affected joint, we find them bearing everywhere the stamp of this disease, not only in the *eburnation* of their articular surfaces, whose margins were studded round with bony growths; but we find also the clavicle and acromion bearing characteristic marks which, we do not hesitate to say, have never yet been noticed as the result of any other disease. Passing from the consideration of the bones in this specimen to that of the other structures, we find that the capsule was thickened and distended with a large quantity of synovial fluid; that, in short, here the "hydrops-articuli" existed, which we have usually seen in other joints affected with chronic rheumatic arthritis (see Atlas, Plate IX., Fig. 1., A B). And that this was the disease which, no doubt, had affected this shoulder-joint we may further infer from the circumstances, that the glenoid ligament and the cartilage of incrustation covering the glenoid cavity, as well as the articular portion of the tendon of the biceps, all were removed; while, at the same time, there was a development of these "subovate bodies like melon seeds," which, I have

reason to believe, should be classed among the morbid results belonging exclusively to chronic rheumatic arthritis (see Treatise, pp. 199, &c.).

I will add, that I feel a firm persuasion that, if the symptoms which the individual to whom this joint had belonged could have been ascertained, they should have been just such as those we have detailed as belonging to the case of Stafford. And further, that should ever an opportunity occur of examining anatomically the shoulder-joints of Stafford, that the appearances which shall be seen to present themselves at such an examination will be found exactly like those of the specimen alluded to, which is contained in the museum of the Royal College of Surgeons, and of which a graphic delineation is given in Atlas, Plate II.

*Secondly, as to the Left Knee-joint.*—The signs of a true luxation of the bones of the left knee, in this case the result of chronic rheumatic arthritis, reminded us very much of the appearance that we have seen assumed by dislocations of the knee, which have been the immediate consequence of accidental violence. In the case of luxation of the knee from accidental violence, all the ligaments, inside, as well as outside the knee-joint, and some of the tendons, are suddenly ruptured, and the powerful muscles around forcibly shorten the whole limb, causing the bones of the leg to overlap the lower extremity of the femur, and ascend in front of it, rendering the limb, as mentioned above, two inches shorter than the other limb.

In the case of slow disease as the result of chronic rheumatic arthritis, an analogous displacement of the bones occurs, but the fibrous structures, instead of being suddenly torn by violence, as above mentioned, are slowly disintegrated by chronic disease, unaccompanied by suppuration; and when all the fibres of the ligaments are destroyed, then, suddenly, the surrounding muscles complete the luxation, as in the case of accident.

In the case of luxation produced, as the effect of slow disease, we have the same shortening of the whole extremity, the same conspicuous rounded projections posteriorly into the popliteal space (see Fig. 30, A B), formed by the lower extremity of the dislocated femur, and anteriorly we have the same remarkable transverse sulcus, c, in front of the femur, just above the patella, as we have in the accidental luxation. We can also remark in this case of Stafford the same resistance of the limb to flexion at the knee-joint; and we notice in cases of accidental luxation the same remarkable abnormal mobility in the lateral direction.

With respect to the present actual condition of the bones which enter into the composition of the left knee-joint, they can in this case of J. Stafford be each respectively felt through their coverings, and their abnormal positions, relatively to each other, can be as easily comprehended as if they were bare before us: the states of the crucial, lateral, and capsular ligaments, and all the other articular textures, may

be inferred from what the investigations of analogous cases have already taught us. At least we can state our experience, that in similar cases of great abnormal mobility of the knee-joint, the result of chronic rheumatic arthritis, we have found on making the post-mortem examination of them, the crucial ligaments completely removed, and other structures atrophied (see case of Sheridan, also of Lynch).

The alteration in form of the bones composing the shoulder-joint and knee, as well as the relaxation of their ligamentary connexions, was in this instance, as is usual in cases of chronic rheumatic arthritis, accompanied by the chronic synovial effusion already described, the peculiar crackling noises heard on motion, &c. &c.; and all these, together with the history of the former and present condition of the patient, point out this as a well-marked example of chronic rheumatic arthritis. Moreover, the patient is stated to have had pains in his limbs, which were influenced by the state of the weather. We learned that there were cringing noises heard in the joints, and that crepitation was felt when motion was communicated to them; there was also symmetrical deformity of almost all the joints. As to the shoulders, the right was now nearly as badly affected as the left; and, as to the affected knee-joint, there was the increased breadth of the patella—a symptom which, in my opinion, might be almost said to be a pathognomonic sign of chronic rheumatic arthritis of this articula-

tion ; and, finally, let us note the increased quantity of synovial fluid which existed in the shoulder and knee-joints, as well as the foreign bodies which could be plainly felt in both articulations. The metacarpo-phalangeal joints of the thumb, *r*, and the fingers, show traces of nodosity of the joints. The toes of both feet are evidently affected by the disease—they are arched ; their convexity being to the dorsal aspect ; and the patient complains of their being painful and stiff.

The patient's pulse is regular ; his appetite and digestion good ; an analysis having been made of the urine and serum of the blood, nothing unusual was observed.

#### TREATMENT.

In such an advanced stage of chronic rheumatic arthritis of the knee and shoulder-joints as is described in the account given of the foregoing case, it did not appear to me that much benefit was to be expected to be derived from the adoption of any specific line of medical treatment carried on within the walls of an hospital. The patient suffered no pains in his joints, and his general health was undisturbed. He was therefore detained but a short time in the institution. As he could perform all the "underhand motions" of the upper extremities, he could work well with his carpenter's tools at his bench, if it were not for the very lax condition of the left knee-joint. On his first admission, we had thoughts of endeavouring to bring

about an ankylosed state of the left knee-joint; but, for my part, I felt by no means sanguine that such an attempt should prove at all successful. I was then, and am still of opinion that to undergo the process of bony ankylosis is not one of the tendencies of joints affected with chronic rheumatic arthritis; and I must now say that I totally despair of its occurring in a case where such an amount of mobility of the knee-joint exists, as in the case of J. Stafford. The simple indication of treatment appeared to be, that the patient should continue the use of the same mechanical appliance which he has found to answer for some years, to counteract the abnormal mobility of the knee, and enable him to move about a little, and to stand at his bench, and work at his trade as a cabinet-maker. The delineation of an instrument suited for such a purpose, as it appeared to me, was to be seen figured in the valuable work of Bonnet;\* but in that which I desired to be constructed for J. Stafford, it was thought proper to suppress the hinge-joint at the knee, as the object was to render the limb stiff, and to favour ankylosis, if any such result of treatment could be hoped for. The instrument was composed of two steel rods, which corresponded respectively to the outer and inner sides of the limb. These lateral rods were continuous below, forming a loop or stirrup, the basis of which traversed the sole of a boot, which was

\* *Traité de Thérapeutique des Maladies Articulaires.* Par A. Bonnet, p. 345.

laced round the ankle. The outer steel rod was joined above, transversely, by a leathern girdle, which was strapped around the waist: a hinge-joint in this outer rod, allowing of flexion of the

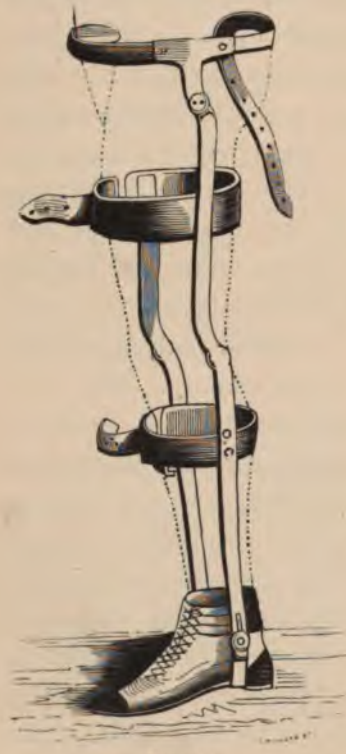


FIG. 32.

Apparatus for the support of the knee-joint applied in the case of Stafford.

thigh, corresponded to the situation of the hip-joint; while below, in both of these lateral supporters, corresponding to the situation of the ankle, a hinge-joint also existed. Two transverse bars—the one placed behind the centre of the thigh, the other behind the calf of the leg—well padded, and covered with chamois leather, half encircled the limb posteriorly in these two situations, while the circle was completed by leathern straps buckled in front of the leg and thigh.

In this apparatus the limb was secured, and all motion of the knee-joint prevented, while the two hinge-joints existing in the apparatus—one at



the level of the hip, and the other at the ankle\*—allowed of the necessary movements in walking.

Stafford appeared this morning, February 20, 1868, at the Richmond Hospital, with the above-mentioned apparatus applied, having worn the instrument for eleven years, and he stated that he derived the greatest advantage from the use of it, as it enabled him to stand and work at his bench for several hours a day, and it was by its aid he walked from his residence this morning to the hospital.

We should, however, here also mention, that in addition to the steel apparatus (Fig. 32), the limb was included, from the trochanter-major to the ankle, in a case made of sole leather, enveloping the entire circumference of the thigh, knee-joint, and leg, and closely united in front by buckles and straps.

As patients affected with this form of chronic rheumatic arthritis of the knee, attended with a lax condition of the ligaments of the joint, can move about without pain, it becomes the more necessary to warn them against the bad consequences which

\* It was found very convenient to the patient to have the boot and lower loop of the instrument, which are incorporated with it, removable at pleasure, without disturbing the rest of the apparatus. This object was accomplished by having the joint of the ankle formed by means of screws and nuts, which last could be readily taken off, and the boots and stirrup removed. The instrument was manufactured by Mr. Read, Parliament-street, instrument maker to the Richmond Hospital.

may be expected to follow, should the patient persevere in using the limb, as he is usually disposed to do, unsupported by any mechanical appliance.

There was, on the 27th December, 1857, in the Richmond Hospital, under the care of my colleague, Professor Smith, a case of this disease which affected the knee. The patella was fully one inch broader on the affected than on the opposite side, and the breadth of the superior extremity of the tibia gave also an equal increase of an inch in the transverse measurement of the diseased over the healthy tibia in the same situation. The joint was weak, and bent *out* very much every time the patient walked or threw the weight of his body on the affected limb, but walking did not give him pain ;— in short, he seemed now to be affected with exactly the same form of chronic rheumatic disease as that which existed in the left knee of Stafford ; but the complaint was in an earlier stage. The following is its history :—

### CASE XIX.

CHRONIC RHEUMATIC ARTHRITIS OF THE RIGHT KNEE-JOINT, OF THE HYPERTROPHIC FORM—ABNORMAL MOBILITY OF THE JOINT IN THE LATERAL DIRECTION—FOREIGN BODIES IN THE SYNOVIAL SAC—FREQUENT EXPOSURE OF THE PERSON TO SUDDEN TRANSITIONS OF HEAT AND COLD, AND OVER-EXERTION OF THE JOINT, THE SUPPOSED CAUSES OF THE DISEASE.

JOHN RYAN, aged 41, an active and athletic quay porter, who has been chiefly occupied in attendance

on steam-packets, and in lifting heavy burdens on and off board, was admitted on the 21st November, 1856, into the Richmond Hospital. The patient's right knee is of an irregular globular form. A fluctuating swelling exists at each side of the patella, and extends upwards beneath the crureus muscle for two inches. The popliteal space presents also a similar fluctuating swelling posteriorly. The internal condyle of the femur projects very much inwards, while the head of the tibia leans outwards. The patella is unusually broad, measuring transversely three inches and a half, which is one inch more than the breadth of the opposite patella. When we examine deeply the condyles of the femur, we find the lateral articular margins studded round with bony nodules, which are easily distinguished through the skin. The condyles do not seem to be otherwise enlarged. The superior articular head of the tibia seems greatly expanded, when compared with its fellow of the opposite side, being fully an inch wider than it. The anterior margin of the articular surface of this bone is greatly elevated above the level of the rest of this surface. This margin is rounded, and represents, from side to side, not a level, but an undulating line. The anterior part of the tibia, where the ligamentum patellæ is inserted, is rendered more flat and rounded than usual, not presenting the ordinary prominent tuberosity.

The patient himself, on his admission, directed our attention to a foreign body which exists in the

knee-joint. Sometimes this body will be found high up, being situated one inch higher than the patella: sometimes it is found internal to the inner edge of this bone: sometimes it can be felt external to its outer margin. This body is of a rounded form, about the size of a filbert, and so smooth is its surface, that it slips away under the pressure of the fingers from place to place within the joint. The patient, in walking, finds it occasionally interpose itself between portions of the articular surfaces, causing him a momentary uneasiness. He has also occasionally pain in the joint, of a rheumatic kind, which is usually referred to the inner side of the knee. It is, he says, always most severe in frost and wet weather, particularly the latter. If we lay the palm of the hand flat on the anterior surface of the joint, and alternately flex and extend the joint, a rough grating sensation is perceived, and crackling sounds are at the same time heard. The patient cannot fully flex the leg. Whenever we attempt to bend the limb for him, so as to make the degree of flexion more acute than a right angle, the patient complains of pain. When he walks, the affected limb bends outwards at the knee. On these occasions the *whole limb seems bowed into an arch, with the convexity outwards*. The motions of the joint are unaccompanied with pain, but the patient has a sense of weakness in it. We can perform the experiment of pressing against each other, in the vertical direction, the articular surfaces of the affected knee, and we can even forcibly strike the sole of the

foot from below upwards, and these manœuvres become the source of no inconvenience whatever to the patient. It is also remarkable, that, with such an amount of apparent disease of the knee, there is no wasting of the thigh nor of the calf of the leg of the affected limb.

We conclude that the foregoing case is one of chronic rheumatic arthritis, because the pains are influenced by the weather ; because, also, of the noises which are heard, and the crepitation which becomes evident on motion being communicated to the joint ; to which we may add *the great breadth of the patella*, and the enlargement of the superior articular extremity of the tibia ; the nodulated margins which can be felt through the skin on the lateral edges of the femoral and also on the tibial condyles ; the existence of one or more foreign bodies in the interior of the synovial sac, which is evidently dilated, and somewhat distended with synovial fluid, to which we might add the abnormal mobility of the joint, unaccompanied by pain.

When looking, however, for any other evidence of rheumatic gout in any of the other articulations than this exhibited by the affection of his right knee-joint, we see none except a nodosity of the joints and an abnormal arching of the small toes, to which we may add, that there is also on the dorsum of the right foot a prominency of the extensor tendons, a condition which usually accompanies nodosity of the toes, and reminding us of the case of Leonard, already described, and whose foot is delineated

(Fig. 22, page 254). Ryan also complains of fugitive pains in the opposite leg, extending down the front of the limb to the toes.

It has been stated, that besides the extraordinary laborious exertions which this man's duty subjected him to, daily, for six years, which might have induced the disease in his knee, he was also all the time exposed to great and sudden transitions of temperature during his occupation as steam-packet porter ;—for example, he was sometimes labouring below near the steam-engine of a vessel, and then suddenly exposed on deck to severe weather, all which were likely to set into action any predisposition to rheumatic arthritis latent in his system.

As to his habits, he states that although he could not be considered a man of uniform temperance, still, that he very seldom exceeded as to drink. He always felt himself equal to any amount of labour imposed upon him, until about eighteen months ago, when he, for the first time, felt pain in his right knee. This pain was at first accompanied with startings of the limb at night. The joint at this time became considerably swollen and distended with synovial fluid, None of these symptoms, however, appeared to him of much consequence, and he never, on account of them, desisted from labour even for a single day, until the increasing sense of weakness of the limb induced him to apply for advice to the hospital.

The patient has now been six weeks in the house. He has taken hydriodate of potash and cod-liver oil,

and both these medicines have been used as external applications to the swollen knee, which has been subsequently treated by compression. Adhesive straps of mercurial ointment and soap plaster have been constantly applied, and the whole limb bandaged; but little impression has been made on the disease in the knee, except that the soft swelling, or *hydrops articuli*, has been on the whole somewhat diminished. He feels, however, the same weakness in the joints as formerly, and the same inability to follow his laborious occupation as a quay porter; he therefore seems much disappointed, and in a mood unwilling to attend to advice, which certainly should dictate to him the propriety (if possible) of his abandoning for the future the onerous duties of a quay porter, and of submitting himself to the only treatment, in my opinion, suitable to his case, namely to have the limb supported by some such mechanical contrivance as that used by Stafford (see Figure 32). For my part I must say, that if, instead of adopting this advice, which he appears but little disposed to follow, he still will persevere in using his limb unsupported, the ligaments of the affected knee will some day (as in the case of Stafford) suddenly give way, and he shall then be placed in a position difficult to relieve. On the 24th of January he was discharged from the hospital, and never applied again at the institution.

## BATHS.

In considering further the actual medical treatment of this obstinate chronic disease of the joints, we must not omit to make some allusion to the use of baths. In the former edition of this work I have thus written: "But it will naturally be asked—Are there no thermal springs famed for the cure or the alleviation of the distressing symptoms of this disease? It is said that the waters of Bath and Buxton have been found useful; those of Carlsbad are reported as being beneficial to the patient afflicted with gout, and those of Wiesbaden and Aix-la-Chapelle to such as are crippled by rheumatism; and it is imagined—not altogether without a show of reason—that the kindred complaint to these, namely, chronic rheumatic arthritis, may be alleviated as to its most urgent symptoms by a course of the waters at some of these sources of health.

"The study, however, of the important subject of the treatment of this disease has not yet been sufficiently advanced to enable us to decide as to the positive or relative merits of these several watering places; but when the affection has become more generally understood, and distinguished from gout and rheumatism, properly so called, and the results of experience have been faithfully recorded, then, and not till then, will the physician be enabled to speak more positively as to the general medical treatment, both of the local and constitutional form of chronic rheumatic arthritis."



To these observations, made above eleven years ago, we have now to add that there can be no doubt that the affection called *rheumatic gout*, or chronic rheumatic arthritis, has become more generally understood, and distinguished from gout and chronic rheumatism, properly so called; and since the publication of my treatise on the disease in 1857, two eminent medical men—viz., Drs. Fuller and Garrod\*—have in the last editions of their works on gout and rheumatism each recorded his experience as to the medical treatment of rheumatic gout. To some of their opinions I have already adverted, and I may now, perhaps, profitably refer to their observations on the administration of baths, and as to the merits of these in the treatment of rheumatic gout.

Dr. Fuller remarks that in the treatment of this disease, when everything else fails, baths not unfrequently afford extraordinary relief to the patient. He observes that, "Whatever may be the *modus operandi* of the waters, their free use, both externally and internally, at their sources, exercises a beneficial influence which is in vain sought for in medicine and bathing at home. The effect produced is at once sedative and tonic. The pain-worn sufferer, irritable and anxious, repairs to the springs, unable to sleep, and troubled with dyspepsia, &c. After ten days or a fortnight's trial of their virtues he begins to find himself less irritable, less

\* Loc. citat.

anxious, and less wakeful; he sleeps more soundly, and feels more refreshed by his sleep; his digestion improves; the whole system is invigorated; and after a time the excretory organs act more efficiently, so that it becomes unnecessary to have recourse to medicine for their relief; there is no fresh accession of pain and inflammation, or synovial effusion; on the contrary, the enlargements of the joints gradually subside, and by the assistance of the water, applied in the form of douche (whereby local friction is combined with fomentation), the stiffness disappears, and the patient, to a great degree, regains his former activity.

Thus Dr. Fuller, like Sir Thomas Watson, and others, strongly recommends the employment of warm baths, approving most highly of those rendered alkaline by the addition of one pound of the carbonate of soda or carbonate of potash to each bath. The value, he says, of this auxiliary has been ably pointed out by Dr. Wright, of Birmingham; and adds, that in his (Dr. Fuller's) experience many cases, which have resisted ordinary treatment, have yielded readily soon after this alkaline bathing has been commenced. Repeated, he says, on alternate days, or daily, when the skin is sluggish in its action, a bath of this description appears not only to mitigate the severity of the local symptoms, but to promote a free secretion from the skin, the liver, and the kidneys, and so to be conducive to the restoration of health.

In referring to the treatment of rheumatic gout

(the nodosity of the joints of Haygarth) by warm baths and douches, we should not omit to notice that this physician, about one hundred years ago, recommended to his patients these means, and advised, for the better use of them, that they should resort to Bath and to Buxton, when they could; and when they could not, that they should use them at home; but perhaps we cannot do better than to quote the quaint words of the author upon this matter:—

“If warm baths, and a warm douche on the nodes, afford benefit, they might, perhaps, be employed with most advantage at Bath or Buxton; but many valuable matrons afflicted with this disease cannot conveniently leave their own homes, and desert their domestick duties. Without considering the question, what superior advantages those naturally warm fountains may possess, I should advise such patients to use a bath at ninety-two up to ninety-six degrees of heat, for ten, fifteen, twenty, up to thirty minutes every other day.”

“If, as is probable, the force with which the warm stream is usually impelled upon the afflicted part be conducive to its salutary effect, even this advantage might be obtained by a pump, or by placing the vessel about ten or twelve feet high, and conducting the current through a proper pipe on the nodes.” He continues:—

“However, as so little knowledge has been practically ascertained upon this subject, I should advise an attentive and comparative trial of bathing and douching at different temperatures, from eighty-

one to one hundred and thirteen degrees of heat, always following the *patient's report* as to what warmth agrees best, and is most of service in alleviating the pain, swelling, and impeded motion of the joints."

SHOWER BATH, VAPOUR, AND HOT AIR BATH.

In the treatment of many cases of rheumatic gout we can speak favourably of the use of the shower bath, particularly where there is, as Dr. Fuller says, a want of tone in the system, with depression of spirits, coldness of the extremities, and frequent clammy, weakening perspirations. In these cases the greatest benefit is derived from the cautious use of the shower bath; indeed, amongst the younger sufferers from this complaint, he says he knew of no single remedy so generally efficacious. Even when, under ordinary circumstances, the patients lack sufficient vigour to withstand its shock, it may be often made available for their relief, by their taking it while standing in a warm bath of the temperature of ninety-eight degrees, in which they have been previously immersed.

In cases in which the patient cannot bear the shock of the shower bath, the *vapour* or *hot air bath* is well worthy of a trial; and if not too frequently had recourse to, will often be found to do good service to the patient afflicted with rheumatic gout (see page 304).

When the sufferer from rheumatic gout has in

vain sought relief from other means, and is resolved to try the efficacy of baths in these countries or on the Continent, he should endeavour previously to inform himself well as to the nature and quality of the water of the spring he is about to resort to, and as to its suitability for his case and constitution.

Sometimes the patient (except for his local disease) is otherwise in excellent health ; and in such cases strong alkaline waters, taken at their sources, may be well borne, and prove well suited to the constitution of the patient ; but, on the contrary, there are other cases where the patient is very weak, and in such the depressing effects of a course of alkaline waters may prove irretrievably injurious. Let the invalid, therefore, before he leaves home, have the advice of his habitual medical attendant as to what watering place he should resort to with a view to obtain relief from his special complaint ; and when he arrives at the place of his destination, he should *then* seek the directions of some eminent local physician to select the spa suitable to his special case, and who should have a surveillance over him during the time he is making use of the waters.

If the patient be strong and vigorous, the more powerful waters, like those of Vichy and Carlsbad, may be resorted to ; but, on the contrary, if the patient be weak and anemic, as is often observed to be the case, a very different treatment by baths, &c., is required.

Dr. Fuller, with reference no doubt to the class

of patients who have come under his observation, observes that we are more frequently called upon to administer relief to those whose enlarged joints give abundant evidence of long-standing mischief—whose sallow complexion attests the long continuance of general derangement. As to the use of mineral waters in the cachectic cases alluded to, much caution is required. The waters useful to such weak and cachectic cases will be found to be those which will tend to restore the tone of the system which has been lowered—such as the ferruginous waters of Schwalbach, Spa, and Tunbridge Wells. The use of these waters, combined with the accompanying change of air, and freedom from care and business, may be often attended with great advantage, and may arrest the progress of the disorder. Baths, however, will be found principally useful in combatting the sequels of the affection, and in restoring mobility to the affected joints, and giving suppleness to the muscles. For this purpose, Dr. Garrod says, salt or sea-water baths, or the vapour or Turkish bath may be employed, and warm douches and shampooing are also of great advantage.

The only question which arises in each particular instance is the place best calculated to promote the well being of the patient. In England, the waters of Bath, Harrowgate, Buxton; and abroad, those of Aix-la-Chapelle and Barèges, Wiesbaden, Wildbad, and Baden Baden, Carlsbad, Toeplitz, and Vichy, are amongst the most celebrated and efficient; but of course the physician's selection must be determined

by the result of his inquiries into the history of each case. The baths of Harrowgate, Aix-la-Chapelle, and Barèges belong to the class of *sulphureous waters*, and being more stimulant than the other waters alluded to, are sometimes of service in old-standing atonic cases, even when other springs have failed. The two latter are peculiarly adapted for persons of feeble circulation, who suffer greatly from the effects of cold, and are invigorated by warmth, while the well-known bracing air of Harrowgate is suitable to those who can take active walking exercise. Judiciously administered, and varied according to the circumstances of each case, the sulphureous waters of England and those of the Continent have proved a source of renewed health to many a victim of rheumatic gout. The springs of Bath, Wiesbaden, Baden Baden, and Teplitz and Carlsbad contain in solution a small quantity of iron, and hence are especially useful whenever there is a deficiency of red globules in the blood, and the patient is pale and anemic. The waters of Vichy, that is to say, most of the springs, are strongly alkaline, and are most beneficial in cases characterized by extreme acidity of the stomach, whilst those of Buxton and Wildbad, which are strongly impregnated with nitrogen gas, have earned a well-merited reputation in cases marked by the existence of wandering pains, without the concurrence of much inflammatory action. "But observation has convinced me," says Dr. Fuller, "that the pallid victim of rheumatic gout who suffers from cold, and is unable to bear the sti-

mulant effect of the sulphur waters, will usually experience more relief from a month's residence at Bath than from a much longer sojourning at any other watering place."

#### BARÈGES.

To give my readers an idea of the heroic manner in which the water treatment is carried on for the cure of obstinate chronic affections of the joints on the Continent, let me refer to the report of my friend, the late Mr. Carmichael, and to the account he gives of himself when undergoing treatment by baths at Barèges, from which he ultimately derived much benefit.

He commences his account of Barèges thus :—  
" Barèges is situated at an altitude of 4190 feet above the level of the sea; its climate is consequently so cold, that few resort thither before the middle of June, and it is nearly deserted by the beginning of October. This village is situated in a deep valley or cleft of the mountains. It is inhabited only during the summer months, for the houses are shut up during the winter and spring. The numbers that flock to this remote and extraordinary village from all parts of Europe render it extremely difficult to obtain accommodation, and lodging is consequently very expensive. The waters are sulphureous, and of a very high temperature—from 30° to 45° of Reau-

\* Dublin Journal, Vol. 13, page 286.



mur, *i. e.* from 100 to 135 of Fahrenheit. They are extremely nauseous to the taste. I was obliged to wait a fortnight, so numerous were the claimants, before the inspector of the mineral waters could grant me leave for the douche, although half an hour only is given to each individual ; and a succession of patients, both night and day, anxiously wait for their turn to partake of this fountain of health. In the interval, I, however, used the warm bath, at the temperature of 96°, from which I received decided benefit. My turn at length arrived for the douche, which I had the option of taking either mild or severe. I preferred the latter. Eleven o'clock each night was the time appointed, and I considered myself fortunate to be permitted to use it even at this inconvenient time. At the appointed hour every night I found a *chaise-a-porteur* at my lodging ; in this I was conveyed in a few minutes to the douche. By the light of a glimmering lamp I found myself in a cell or dungeon which appeared to be cut out of the rock ; it was, however, so hot with sulphureous vapour that at first I felt nearly suffocated, and I was glad to disencumber myself as quickly as possible of my clothes, in which I was assisted by a surly, grim, old attendant, who seemed naturally to appertain to a place filled with fire and brimstone. As soon as I was stretched upon a mattress which lay upon the floor, he turned a large cock about ten feet from the ground ; the water, which was at the temperature of 120° Fahrenheit, fell therefore with considerable force ;

and such was the shock I first felt, that I could scarcely refrain from crying out ; however, I summoned resolution, and bore it for fifteen minutes, which my attendant said was the longest period that any person had been able to suffer under this infliction, ten minutes being the usual time. I found it very fatiguing as well as warm work, and that I really required the assistance of my grim attendant to put on the flannel dresses with which I had come provided. This being done, I was immediately re-conveyed by the same machine into my bed-room, where, without taking off my flannel dress, I got into bed between the blankets, and in a few minutes afterwards was covered with a profuse perspiration, which continued for four or five hours, and was promoted by drinking freely of some mild warm beverage. As soon as it had ceased, I changed my flannel dress for another, and remained in bed for several hours afterwards.

“I have been thus minute in my detail of trifling particulars for the benefit of those who purpose going to Barèges. The difficulty even of obtaining lodgings is so great that it would not be advisable for any patient to go there until he had secured one, and also permission from the inspector of the mineral waters to have a time allotted for his douche or bath ; and he should also take especial care to go well provided with changes of flannel dresses. I continued the use of the douche daily, or rather nightly, for a fortnight, and derived much benefit from their use.”

## AIX LES BAINS.

AMONG the watering places on the Continent which have long maintained a reputation for being useful in cases of chronic affections of the joint, we should not omit to mention Aix les Bains. "The town is exquisitely situated" (as described to me by one of my patients, a young medical man, whom I had induced to go there), "and is surrounded by the most magnificent mountains, the valleys of which are filled with the richest crops. Besides, close to the town is the lake Bourget, one of the most beautiful lakes I have ever seen, on which excursions are made in boats by invalids, and the pleasure of fishing enjoyed.

"As to the use I make of the waters, &c., I may say, I take the douche four times a week, and once a week a full bath in the piscine. This is a large bath about twenty feet in length, and fifteen feet in breadth. In this (the temperature of which is eighty-eight degrees, Fahrenheit) I remained a full hour. The douches last fully twenty minutes, and I do not find them at all so exhausting as I expected. This is, I am sure, owing to the great care and attention to minutiae which is exhibited on the part of all the officials connected with the baths. After the douche is over, having been dried, I am packed up in flannel, put into a machine like a sedan chair, and carried back to my hotel, where I am then placed in bed for twenty-five minutes, still encased in the flannel wrappers, and during this

time I perspire profusely; then the wrappers are taken off, and I am thoroughly dried; then go back to stay in bed for an hour afterwards. In addition to that, I take a glass of the sulphureous water in the morning before breakfast, and another at four o'clock in the afternoon. It has no purgative action. I shall pay great attention to your suggestions as to my not allowing my knee to be too much handled in the douche bath. Indeed the energies of the shampooers have been hitherto directed chiefly to the muscles of my thigh, which are in such an atrophied state. I cannot as yet report any very great improvement; but indeed I have not yet been here long enough to enable me to make any full report of myself."

In another letter, a fortnight later, he says:—

"I take the bath now twice every day—a douche in the morning at six o'clock, and a full bath in the 'piscine' in the afternoon. In the latter there are arrangements for douching one's self, and I can regulate the temperature and the force of the stream of water, according as I wish it. I remain in fully an hour, and never feel in the least exhausted by it, but quite the reverse. I am not sure whether I told you that, in addition to the baths, I take every day the '*Eau de Challes*.' It is an alkaline sulphureous water, and contains also iodine and bromine. It is *most* unpalatable, and at first had a purgative effect on me; but this action has quite subsided, and I am now able to take it without any inconvenience.

“ Since I last wrote, I am happy to be able to say, that I have made a most marked improvement. I am now able to walk about my room, and up and down stairs, without the assistance of my stick; and I have even been able to walk a little about the town without this aid! The pain in my left shoulder, which has been so annoying to me during the last six weeks, has nearly disappeared; in truth, in every respect, the improvement has been most signal. Dr. Berthier, the resident physician, thinks that I may return home in a fortnight.”

I may here also refer to another example, illustrative of the good effects and mode of application of the waters of *Aix les Bains*, in a case where an obstinate chronic arthritic affection of the knee existed, and which had previously resisted much varied surgical treatment. The case was that of a gentleman, aged twenty-seven; he was a learned and literary man, who for some time previous to his having this affection of the joint had been exhausted by too much mental labour. When I saw him he had a chronic arthritic affection of the knee, attended with a set of somewhat anomalous symptoms. He complained of a sense of coldness of the joint, and of uneasiness in it, which seemed to be relieved only by the constant application of cloths saturated with cold water. The patient was lame, and disabled from all kinds of exercise, except that of a carriage. As the affection of the joint had hitherto resisted all treatment, this gentleman resolved to take a course of the waters at

Aix les Bains, where he sojourned for six weeks, and he derived the greatest benefit from following the means usually resorted to there for the treatment of chronic affections of the joints. Having heard of the complete recovery of the knee-joint in this case, I wrote to the patient, and, knowing him to be a man of much intelligence, requested him to give me his opinion as to the merits of the waters of Aix les Bains, and as to the mode in which they had been administered in his case, and he was kind enough to reply to me as follows:—

“In my case the douche was applied by two men, one of whom turned it on my body; the other, with a separate tube, at the same time turned a douche on my knee, both men shampooing me vigorously all the while. The water was put on nearly as hot as I could bear it, and the operation lasted twenty minutes. At the end of that time I was rolled up in blankets, and carried in a close chair to my hotel, where I lay in bed for about half an hour, sweating very profusely.

“There cannot be a doubt that I derived great benefit from my sojourn at Aix les Bains.”

#### DIET, EXERCISE, CLOTHING, CLIMATE.

It seems to be the opinion of the few physicians who have specially considered the treatment of rheumatic gout, that the diet of the patient should be simple and nutritious, but not stimulating; some well-cooked vegetables may be allowed, but in small

quantity, as they tend to promote acetous fermentation; and, for the same reason, it is scarcely necessary to say, that salads and pickles should be avoided, as well also as beer, sugar, and pastry. There are, however, many sufferers, as Dr. Fuller truly remarks, to be met with, affected with rheumatic gout, who present a clean tongue, a cold and clammy skin, a feeble pulse, and whose urine may be found, on examination, to have a pale colour, and a light specific gravity. In these a spare diet, and abstinence from stimulants, would counteract all the good which might accrue from the use of medicine. Such persons must be cautious as to the selection of their food, which should be light and nutritious, and be taken at shorter intervals than usual, and they are generally the better of some such stimulant as brandy or whiskey. Their appetite requires to be encouraged, and they are the better of light nutriment, such as beef tea, between the hours of their regular meals; even ale and porter need not always be prohibited.

Above all things, it is necessary for the sufferer from rheumatic gout to *exercise* freely and regularly. The exercise should be suited to the strength and condition of the patient, but it should always be sufficiently active to produce a free perspiration. Nothing tends more directly to the perfect oxygenation of the blood, and to the furtherance of those actions on which the maintenance of the general health depends, than active exercise in the

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open air. In the earlier pages of this treatise (see page 24), I have stated my belief that many of the inmates of our poorhouses, afflicted with rheumatic gout, suffered severely from want of exercise; *the circulation of their blood through the heart and lungs thereby became languid*; their joints rigid, as well as painful; and their muscles, through disuse, fell into a state of atrophy.

In the former edition of this work I stated that there is one important question, which the medical attendant is frequently called upon to decide—namely, whether the patient should yield to his disorder, and condemn himself, as it were, to immobility for life; or whether he should contend against it, and persevere in walking, even though it proved painful and fatiguing? To this I would reply, that in the commencement of the disease, rest, cupping, the frequent use of leeches, confinement to a warm atmosphere, warm baths, and mercurials combined with opium, seem to be the most rational means to resort to, with an expectation of arresting the progress of the affection in its early stages; but, on the contrary, if chronic rheumatic arthritis has gone on to the destruction of the articular surfaces, and the movement of the joint is followed rather by a stiffness of the limb than actual pain, in this case some walking exercise daily may not only be permitted, but recommended to the patient. His general health will be thereby improved, and the articular surfaces will be found to move more freely on each other, owing, most pro-



bably, to the eburnation of them, which we know to be induced by friction and motion.

If, however, on the one hand, it be true that in the early stages of the disease exercise is likely to aggravate the symptoms ; still, upon the other, it is important to have present to our minds the evils that result from the system of the articulations being kept for a great length of time in a state of perfect quietude ; for my experience accords with that of Teissier and Bonnet,\* that prolonged and absolute repose of the joints is calculated to determine serious alterations in the articular structures, such as erosion and thinning of the cartilages, the effusion of a sero-sanguineous fluid into the synovial sacs, the formation of false membranes, &c., &c. Such were the observations I published in the former edition of this work, as to the effects of rest and exercise on joints affected with rheumatic gout ; and as I am still persuaded of their truth, I repeat them here ; and I feel the more confident in doing so, as I find these views, as expressed in the former edition of this work, seem to be confirmed by the later experience of Dr. Garrod, whose concurrence with them may be inferred from the following observations :—“Rest should be enjoined at first, in the hope of aiding thereby the subsidence of the inflammation ; but when the fluid has been absorbed, and the alteration in the joints advanced so far as

\* *Maladies des Articulations*, par A. Bonnet, Tom. i. page 70.

to forbid all ideas of saving the more delicate structures, then a moderate amount of movement is not only not injurious, but beneficial, as it tends to prevent a rigid state of the articulations. The amount of movement must, in all cases, be regulated by the effects produced ; it should always be short of causing pain or tenderness lasting beyond the day on which it is employed.

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## CHAPTER XIII.

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### CASES FURTHER ILLUSTRATING THE DISEASE OF CHRONIC RHEUMATIC ARTHRITIS.

SIR BENJAMIN BRODIE, in the short chapter he has written on "a chronic disease of the joints connected with gout and rheumatic gout," has thus expressed himself:—"Although the opportunities of examining the pathological condition of the joints which are affected in this manner are only of occasional occurrence, there is no surgeon of much experience who has not seen many cases of this disease."

Here the author's experience attests the frequency of this disease, but asserts that there was an absence of information as to the pathological condition of the joints taken in relation with the symptoms of this disease in the living patient. That such an observation should be made so far back as 1850—which is the date of the last edition of his work but one—we should not wonder; but the justness of reiterating, without note or comment, the same observation in the posthumous edition of his work on the joints in 1863, may, in my opinion, be fairly questioned; for many, very many examples of

rheumatic gout have been of late years published, detailing the symptoms the patients laboured under who had been affected by this disease, as well as the pathological appearances the joints exhibited on making the *post-mortem* examination of them in the same individual.

Let me here bring forward two, from among many examples already published, to show that opportunities have not always been lost of investigating, with relation to each other, the clinical history and anatomical characters of this disease.

### CASE XVIII.

CASE OF J. LYNCH—EXAMPLE OF CHRONIC RHEUMATIC ARTHRITIS OF BOTH KNEE-JOINTS, WHICH CONTAINED NUMEROUS FOREIGN BODIES CONNECTED WITH THE VARIOUS ARTICULAR TEXTURES—ABNORMAL MOBILITY OF THE LEFT KNEE-JOINT—POST-MORTEM EXAMINATION—ATLAS, PLATE VIII. FIGS. 2, 3, 4.

James Lynch, aged 30, labourer, was admitted into the Richmond Hospital, in March, 1837, in consequence of both his knee-joints having been affected with chronic rheumatic arthritis. He had then no pain in them, nor was there any constitutional disturbance of his system observable. In his right knee-joint there was a foreign body, which heretofore had been the source of frequent distress to him; but latterly it never incommoded him: he was, however, entirely incapacitated from following his

ordinary occupation as a labourer, in consequence of the very lax and weak condition of his left knee; and it was principally on account of this last that he had at this time obtained admission into hospital.

*Right Knee.*—He stated that he attributed the origin of the complaint in this joint to a severe wetting he got some years ago, after which, on the very next day, he felt some uneasiness in it, not amounting to pain, and some stiffness in its movements. These symptoms, we learned from him, were soon followed by a considerable soft swelling of the joint, which, no doubt, arose from effusion into the synovial sac of the articulation. He stated, that after many weeks the swelling became less; but that although he was not rendered by the complaint incapable of following his ordinary occupation, yet the stiffness he felt on moving about when he first left his bed each morning still continued: he felt also injurious effects from sudden changes of the weather, and noticed “cringing noises” in the joint, such as now can be observed whenever the knee is moved. At the time of his admission, the soft swelling (*hydrops articuli*) which he described as having heretofore existed had now entirely disappeared; and although the bones of the joint could be felt to be somewhat enlarged, still it appeared to perform its functions tolerably, with the exception that there was some stiffness in its motions. On examining the surface of the joint, our attention was directed to its internal side, where,

near to the junction of the internal condyles of the tibia and femur, a little rounded body, about *the size of a hazel-nut*, could be seen to elevate the skin, and could be felt through it: it seemed quite superficial, and could be grasped between the finger and thumb and moved about to a certain small extent, so as to give the idea that it was within the synovial sac, and was attached by a membranous pedicle to the bone.\* The history the patient gave us of this foreign body was, that at an early period of his illness, and at a time when he was free from any complaint in the opposite knee, as he was one day running across a field, he fell down suddenly; and when he got up he felt, for the first time, this small body at the inside of the knee; and that this afterwards often unexpectedly interposed itself between the articular surfaces, and whenever this occurrence took place when the patient was walking or running, it caused him instantaneously to fall down.

The first sub-inflammatory attack of this joint (1833), we learned, was successfully combated by the ordinary treatment, and the occasional inconvenience he had suffered from this foreign body interposing itself between the articular surfaces was completely obviated by the constant use of a fine flannel roller, which he had been taught to apply methodically around the joint.

*Left Knee.*—The patient attributed the origin of the complaint in this knee also to a severe wetting.

\* See Atlas, Plate VIII., Fig. 2 B.

There was at first a slight pain felt in the knee, which was soon followed by the ordinary signs of *chronic rheumatic arthritis*, with considerable effusion into the synovial sac of the joint. This first attack in this joint, after six weeks had passed, partially yielded to active treatment he was subjected to in this hospital two years ago (1835), consisting of cupping, blistering, and a course of calomel, urged so far as to produce salivation. When convalescent from this attack, he left the hospital and resided for two years in the country, and in March, 1837, was re-admitted into the hospital.

On examination, we found that he had now no heat nor pain of any kind in the knee-joint, whether in motion or at rest. Unfortunately, however, the left knee-joint was abnormally movable in all directions, and useless to him. When he attempted to stand, this knee-joint yielded, the femur projecting inwards, and the tibia outwards; in a word, the bones of this articulation seemed connected together merely by the integuments and tendons of the muscles, and it appeared as if all ligamentous connexion had been relaxed or destroyed. In consequence of this state of the left knee-joint, the man required the aid of crutches, and a leathern gutter or appliance to enable him to move about.

It is plain from the history of the chronic affection of the *right* knee-joint, the passive synovial swelling (*Hydrops articuli*) by which it commenced; the stiffness and uneasiness, influenced by the state of the weather, the "cringing noises" heard on motion

&c., &c. ; that this articulation presented an ordinary example of chronic rheumatic arthritis.

With respect to the *left* knee-joint it would appear to me, that after the attack of sub-acute inflammation and the sequelæ belonging to it had ceased, chronic rheumatic arthritis then became established in this joint also, a circumstance which need not excite surprise, considering that in this patient this was the diathesis which seemed evidently to prevail.

The weakened joint was supported by the methodical application of leathern splints ; but although the patient derived some advantage from these appliances, yet, when he was discharged from the hospital as well as it was practicable to make him, he found himself incapable of earning his livelihood as a labourer, and was, therefore, compelled to seek an asylum in the neighbouring North Union Poor-house, where he remained as an inmate for four years. His knee-joints underwent no change, but a chronic disease of the bladder having come upon him, he died of this in January, 1842 ; and I took the opportunity of laying the history of the case, and the post-mortem specimens of the affected knees, before a meeting of the Pathological Society of Dublin held about this date.

#### POST-MORTEM EXAMINATION OF THE KNEE-JOINTS.

*Right Knee-joint.*—The capsular ligament was thicker than natural, but now contained no effusion.



The condyles of the femur presented, along the margins of the articular surfaces, bony vegetations, the characteristic marks of this disease.—(See Atlas, Plate VIII. Fig. 2, c. c.)

The anterior and external margin of the outer condyle of the tibia was in part circumscribed by a rim of bone, which was raised somewhat above the level of the articular surface, presenting an appearance similar to that already adverted to at page 216, and there delineated, Fig. 12, c. The inner condyle of the tibia seemed to have been obliquely carried away, and its place occupied by seven or eight rounded additamentary bones. Where these rested on, or were supported below by the tibia, this bone presented exostotic growths projecting in front, as well as behind also, towards the popliteal space. The additamentary bones, some of which were as large as carpal bones, were overlaid above towards the joint by the internal semilunar cartilage, which was *much hypertrophied*. This fibro-cartilage, therefore, instead of having been either partially or completely removed—the ordinary result of this disease—was, on the contrary, found to have attained to twice its ordinary dimensions (see Atlas, Plate VIII. Fig. 2; also Fig. 4). Connected to the inner side of the internal condyle of the femur, by means of a slender ligament above an inch long, was seen the foreign body which had been felt on the inside of the knee during life, and had been at first the source of much inconvenience to the patient.—(See Atlas, Plate VIII. Fig. 2, B.) The patella was thicker and heavier

than natural, and its margins were studded round with new bony nodules.

*The left Knee-joint.*—This joint, of course now, as during life, presented great abnormal mobility in all directions, as if the articular surfaces had been held together merely by the integuments and tendons of the muscles. The capsular ligament was thickened, and contained but little synovia. The cartilage of incrustation had been partly removed, and the articular surfaces of the condyles of the femur presented many granular nodules of bone, irregularly spread over their surface. The trochlea for the patella was marked by four parallel ridges and grooves\* (see Atlas, Plate VIII. Fig. 3) corresponding to similar ridges and grooves existing on the back part of the patella. These were formed by the mutual action of the bones divested of cartilage on each other, and ran in the direction of the flexion and extension of the joint, and are, no doubt, characteristic marks of chronic rheumatic arthritis. The lateral ligaments were elongated, and the *crucial ligaments had lost all attachment to the tibia*. The semilunar cartilages were perfect, but had attached to them, here and there, foreign bodies, some of which were bony.

\* See foot of page 206, where reference is made to a case given by John Hunter (dated 1759) of the knee-joint, in which the bones of the joint were "hardened, polished, and worn down, in parallel grooves." In this (Hunter's) case both of the knee-joints were symmetrically affected (see Catalogue of Museum of College of Surgeons, England, vol. ii., p. 236).

The external condyle of the tibia was normal, but the internal condyle was deeply excavated, and formed an oval cup, its long diameter from before backwards measuring two inches and a quarter. The surface of this oval excavation had been covered partially with a normal semilunar cartilage; but the cartilage of *incrustation* no longer existed, and the surface of the condyle presented numerous fissures running deep into the osseous tissue, bearing evidence of a commencing process of disintegration of the bone, which was remarkably light. The bones entering into the formation of both knee-joints in this individual were, in their recent state, observed to present in their interior, when exposed by the section made by the saw, an intensely red colour. They were preternaturally vascular from the effects of pre-existing chronic disease, and in a state of atrophy from want of use.

The lengthened condition of the lateral ligaments, and the depth of the excavation of the internal condyle of the tibia, must have contributed to the abnormal mobility of the left knee-joint noticed; but this condition, which had been so much complained of by the patient, was, no doubt, due principally to the loss of the tibial attachment of the crucial ligaments; but, we may here remark, that, an *abnormal mobility* of a joint is not an uncommon complication to be observed in advanced cases of chronic rheumatic arthritis; but as I have already elsewhere in this work fully considered the subject of abnormal mobility of joints in advanced cases of this disease, I need not return to the subject here.

## OBSERVATIONS ON THIS CASE.

We have been frequently reminded, during the course of the preceding observations, of foreign bodies having been noticed to exist within the synovial sac of the knee in cases of chronic rheumatic arthritis of this articulation; and the *right knee-joint*, we see in the foregoing case, presents us with an example of this disease, in which, besides the numerous foreign bodies which were concealed during life within the recesses of the joint, there was one (see Atlas, Plate VIII. Fig. 2, B,) which frequently interposed itself between the articular surfaces, so as to cause much inconvenience to the patient. Now, it appears to me that the possibility of a repetition of such a state of things should be borne in mind by the surgeon; for we know that he is occasionally consulted on the subject of the propriety of removing, by an operation, foreign bodies from the knee. Let him, however, before he decides upon performing such an operation, have previously ascertained that chronic rheumatic arthritis does not at the same time exist in the joint in which is contained the foreign body it is proposed to remove. And here I may take this opportunity of expressing my belief that the excision of a foreign body from the knee-joint (at all times hazardous, though occasionally called for) can never be considered justifiable when this foreign body is the product of the chronic rheumatic arthritis still existing in the joint. In the palliative plan adopted in the foregoing instance will, I ima-

gine, be found to consist all the surgical treatment which can be safely resorted to in such cases.

## CASE XIX.

CHRONIC RHEUMATIC ARTHRITIS OF BOTH KNEES—ABNORMAL MOBILITY OF THE JOINTS—DEATH FROM ACUTE ARTHRITIS HAVING SUDDENLY SUPERVENED ON THE CHRONIC RHEUMATIC ARTHRITIS OF THE RIGHT KNEE—POST-MORTEM EXAMINATION OF THE JOINTS.

MARY SHERIDAN, a servant, aged 56, was, on the 1st of November, 1852, admitted into the Richmond Hospital, under the care of my colleague, the late Dr. Hutton. She had been, on two occasions during the preceding four years, under treatment in the hospital, in consequence of her having been afflicted with chronic rheumatic arthritis of one of her knee-joints; and the symptoms she laboured under were then carefully noted; but now, on her present admission, both are affected with this disease.

As to the *Left Knee*, it was remarked that the internal condyle of the femur projected very much forwards and inwards, while the corresponding head of the tibia was partially displaced outwards and backwards towards the popliteal space, where it could be plainly felt. The leg and foot were rotated outwards. The patella at this side was dislocated completely outwards, and lay on the external surface of the outer condyle of the femur (see woodcut, Fig. 34).

When the limb was grasped by the surgeon above the ankle, and at the same time a lateral movement of abduction or adduction was communicated to it, it could be made to form an obtuse angle with the thigh. These movements were the source of no pain to the patient. On examining the joint deeply, a number of foreign bodies could be felt. On moving the joint, crepitation was perceived, and loud crackling noises were distinctly audible.

*The Right Knee* measured nineteen inches in circumference, and was larger than the left. Foreign bodies could be felt in the interior of this joint also, and there was great abnormal mobility of it in the lateral directions. The patient never complained of suffering pain in the joint; crepitating sounds were heard whenever it was moved;—in short, we learned that in almost every particular this chronic disease affected both knee-joints in a nearly similar manner. She found both equally movable when she attempted to stand or walk, which she was unable to do without the aid of two crutches, and she required, in addition, the help of some person to support her.

As to the previous history of her case, it was collected from her, that about fifteen years ago, she for the first time observed her right knee swollen. This affection of the joint was attended with little or no pain, but she noticed that the joint was very stiff when she commenced in the morning to use it, and that “cringing noises” accompanied every motion of the joint. Although the swelling gradually increased, she continued to struggle against the infir-

mity so long as only one of the knees was affected, and to act with but little interruption as a house servant for nine or ten years, about the termination of which period, she was compelled to give up her place and go into hospital, as her left knee, which had been always quite well heretofore, *now* became affected ; and, after some time in hospital, she was discharged somewhat relieved, but not able to resume her place as a servant.

Since this period, October, 1848, for four years up to the 24th October, 1852, both her knees remained in a nearly passive state of chronic rheumatic arthritis. About the termination of this time, suddenly, without any assignable cause, acute inflammation attacked the right knee-joint, and after seven days of severe suffering she was, on account of it, admitted for the third time into the Richmond Hospital. The notes taken by Dr. Hutton's resident pupil, the late Mr. Bourne, on this occasion, were as follow:—"Both her knee-joints are swollen, but the right much more than the left: the former has been recently visited with acute inflammation, attended with a sudden increase of swelling, with the addition of pain and heat in the part, and with these local symptoms of inflammation are now associated those of general constitutional disturbance. Suppuration has become established in the joint. A pointing outside the right patella has taken place, and a slough about the size of a crown-piece has formed here. Through the opening thus made there issues from the interior of the joint a large quantity of a sero-purulent matter."

The patient had now a rapid, weak pulse, and was evidently run down by the effects of the recent attack of acute inflammation and its consequences, and in one week her constitution (previously enfeebled by a chronic bronchial affection) gave way, and she died on the 8th of November, on the fourteenth day after the acute arthritis had supervened on the chronic affection of the right knee.

#### POST-MORTEM EXAMINATION OF THE JOINTS.

Plaster of Paris casts having been taken of the abnormal knees, they were removed, and a dissection having been made of them by Professor Smith, he laid them before a meeting of the Pathological Society during the winter session of 1852-53.\*

*Right Knee.*—The capsular ligament was exposed, and cut through, and here it presented a cut edge of three lines in thickness. The interior surface of the synovial membrane exhibited a fasciculated appearance: patches of lymph and other traces of recent inflammation existed: some purulent matter was also found contained within the synovial sac of the joint.

#### BONES.

*Femur.*—The lateral margins of the condyles of the right femur, where joined to the inferior ar-

\* Professor Smith's observations on this occasion were not reported nor published; he has, however, kindly furnished me with some notes of them, and the joints are before me as I write. These, as well as the casts showing the external appearances, are preserved in the Museum of the Richmond Hospital.



ticular surface of the bone, were studded round with an exuberant range of bony nodules. The lower articular parts of both condyles of the femur were nearly on the same horizontal level as to each other; and the external condyle, which corresponded to the external glenoid cavity of the tibia, was completely *polished and eburnated* (see Fig. 33, B).

*Tibia.*—The superior articular extremity of the *right* tibia was much altered from its normal form. All the surfaces of this bone were destitute of cartilage of incrustation, and we never have seen the process of eburnation better marked than on the surface which the extremity of the external condyle of the femur and corresponding outer glenoid cavity of the tibia, B, presented. These last-mentioned articular surfaces evidently appeared to have been the centre of the principal movements the knee-joint had enjoyed.

The cavity for the reception of the condyles of the femur was provided for in front by the presence of a remarkable transverse band of bone, D, D, shaped into a crescentic arch, concave posteriorly, of considerable thickness, an inch and a half deep, and of length enough to stretch across both condyles of the femur, which were placed behind it. Its anterior convex surface was parallel with the front of the joint, and placed nearly as perpendicular as the patella.

One margin of this crescentic band of bone was situated superiorly, and the lower margin ranged with the level of the upper part of the tibia, but



FIG. 33.

Case of Sheridan.—View from behind of the patella, tibia, and fibula of the right knee-joint. A, C, portion of the tibia, which was not articular, placed behind the internal condyle of the femur; B, outer glenoid cavity, which was articular, highly polished, and eburnated. D, D, crescentic band of bone, including the tubercle of the tibia, detached from the shaft of this bone. This Figure has been reduced to half the size which the abnormal knee had attained.

was united to it by ligamentary connexions only. Posteriorly, towards the joint, it was fully eburnated, and it completed in front, as before mentioned, the receptacle for the internal condyle of the femur. This crescentic arch of bone seemed to have been made up of several pieces, and its centre to be constituted by the tubercle of the tibia, which still gave insertion to the ligament of the patella, although the tubercle was itself detached from the shaft of the tibia.

The *Patella*, as it usually is in this disease, was much hypertrophied; its posterior articular surface was perfectly flat, and destitute of cartilage; its margin was nodulated by the addition of new osseous granules; its ligament was also broader than usual, and was laterally united to, and almost identified with, this remarkable crescentic band of bone, Fig. 33, D, which was stretched across the front of the joint, as already described.

There were numerous foreign bodies contained within the synovial sac: one of them, very large, Fig. 33, F, lay transversely at the back part of the internal condyle of the tibia. There was no trace of crucial ligaments to be seen in the joint.

*Left Knee-joint.*—The capsular ligament was of equal thickness with that of the right knee-joint, but its internal surface presented no roughness, nor deposit of lymph on it, nor was there any purulent matter seen in its interior. A viscid synovial fluid alone issued from the sac when fully opened. All the structures in the interior of the joint were observed

to be in an hyperemic condition. The inter-condyloid fossa of the femur was occupied with vascular synovial fimbriæ. *There were no traces whatever of crucial ligaments existing in the articulation.* More than twenty foreign bodies were contained within its cavity. Some of these were as large, nearly, as a walnut, and had formed strong attachments: some were smaller, and in clusters, like grapes; they were attached to a common ligamentary stalk, connecting them to an enormously thickened capsular ligament. One of the largest of these foreign bodies occupied the inter-condyloid fossa of the femur, and lay far back, placed transversely. Another foreign body was placed towards the back part of the inner condyle of the femur, in a separate bursa, which, however, was found, on close examination, to have a communication with the general synovial cavity.

While adverting to the numerous abnormal burse which existed around the joint, we should not omit to notice one, Fig. 34, A, which lay obliquely across the superior extremity of the tibia, below its tubercle and the insertion of the ligamentum patellæ. It was quite superficial, and formed a tumour about the size of a hen-egg, recognisable during life (and shown in the cast we possess of the knee). When cut into, this synovial sac was found to be intersected, says Professor Smith, by delicate membranous bands resembling the cordæ tendineæ of the heart: it contained two little foreign bodies about the size of peas. These were connected together

by very fine, but strong membranous cords (see Fig. 34).

*Left Femur.*—The transverse measurement of the lower extremity of the femur, at its broadest part, amounted only to three inches and one-half, being exactly one inch less than that of the opposite femur, measured in the same part. The condyles of the left femur were smaller than natural; their lateral margins, where joined to the articular surface, were studded round with the usual characteristic bony nodules (Fig. 34, B). The external condyle seemed somewhat atrophied; it did not descend within half an inch of the level of the lower margin of the internal condyle of the femur.

The lower extremity of this bone, not only in the manner in which the lateral margins of its condyles were hemmed round with granular bony nodules, B, but also in the circumstance that pointed exostotic growths surmounted the trochlea, resembled much the specimen of a knee-joint delineated at page 215, Fig. 10. Another point of resemblance between these two last was also to be found in the shortened condition of the external condyle, which by no means descended so low as the internal.

*Left Tibia.*—The superior extremity of the tibia had been expanded and hollowed out into an oval cavity, placed transversely, two inches in depth, and measuring fully six inches across, from side to side, and four from before backwards. This cavity was much wider than was necessary to accommodate the diminished condyles of the femur. It would appear

as if the upper extremity of the tibia had been first expanded into this immense abnormal arti-

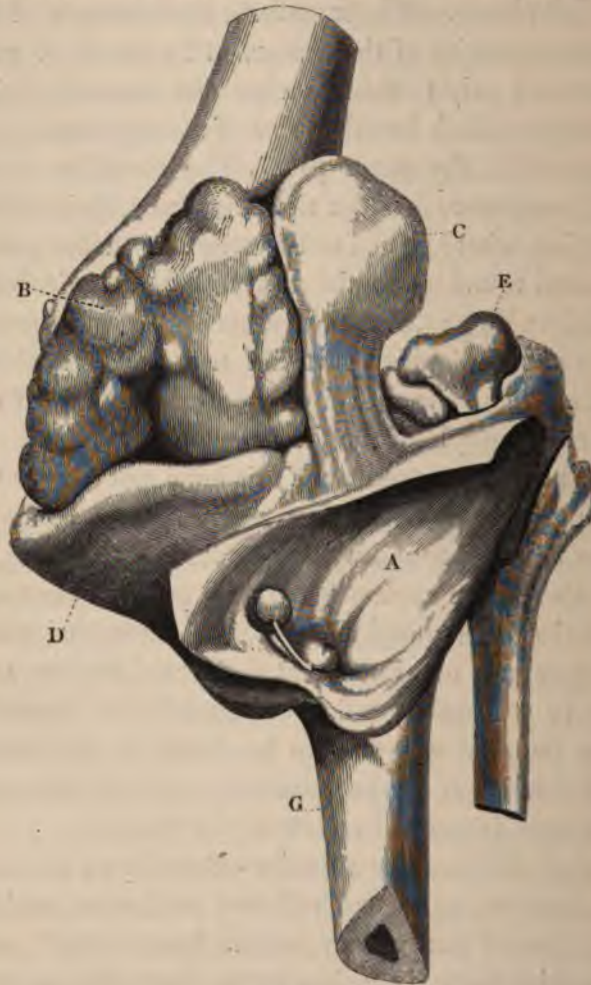


FIG. 34.

Case of Sheridan.—Left knee-joint viewed from before. G, shaft of the tibia drawn backwards into the popliteal space, behind D, the anterior and inner part of the tibia, which was displaced, with the condyle of the femur, forwards and inwards. This Figure has been reduced to about half the size which the abnormal knee had attained.

cular socket, and had then been divided into two portions by an oblique line of separation, leaving a large portion of the upper extremity of the bone behind, which was the continuation upwards of the shaft of the tibia, projecting for two inches backwards into the popliteal space, and a considerable detached portion in front, *D*. This anterior and internal portion, Fig. 34, *D*, of the tibia seemed to supply, by the broad expansion of its upper articular surface, the internal and external glenoid cavity of the tibia, which included also the tubercle of the bone, and it was into this anterior detached and moveable portion, Fig. 34, *D*, that the lower part of the ligamentum patellæ had been inserted.

The glenoid cavities of the tibia thus formed had resting upon their superior surface the condyles of the femur. No investing cartilage of incrustation covered any of the surfaces, nor did any fibro-cartilages exist, nor were there any points of eburnation to be seen; but every interstice formed between the bones seemed occupied by rounded foreign bodies of various sizes, already alluded to.

The patella, Fig. 34, *C*, at this side was luxated completely outwards, so that it thus lay on the lateral aspect of the external condyle of the femur, presenting its inner margin forwards, its outer backwards, and its cutaneous surface externally. The articular surface of the patella was abnormally plane and flat, and destitute of cartilage; its circumference was nodulated.

The ligamentum patellæ had an insertion only

into that part of the tibia, D, which was obliquely detached from the shaft of the bone, G. The upper part of this shaft (which was placed behind the line of separation running across the articular surface of the tibia) was drawn backwards into the popliteal space, as already mentioned, while the shaft, G, was rotated on its long axis so much outwards, that the fibula was placed nearly behind the tibia.

#### OBSERVATIONS ON THIS CASE.

The abnormal mobility of the knees, which in this case was greater than ever I have seen it, was, I believe, owing principally to the loss, from atrophy and disease, of the crucial ligaments. It is true, that, independently of this lesion, there existed also a condition of the bones of the knees which had an influence on the action of the muscles inserted into them, which must also be taken into account when considering the causes of the displacement of the bones, and the abnormal mobility in question. For example, it is plain that the power of the great muscular masses in front of the thigh bones (the quadriceps extensors of the legs) had been in this case altogether annulled, because the bony processes of the tibiæ, into which these muscles are inserted, through the intervention of the ligament of the patella, were detached from the shaft of the tibia, and hence the patient could not, as she lay on her back, by any voluntary effort raise her limbs from the level of the horizontal plane of the bed. From



the same cause of the quadriceps extensors of the legs not having their ordinary fixed point in the tibia, the action of the hamstring muscles must have had the effect of drawing upwards and backwards the superior and posterior parts of the head of the tibia into the popliteal spaces, where they were observed to have formed conspicuous prominences.

The termination of the case by a fatal attack of acute arthritis must be considered as an uncommon, but not an unprecedented event. In the year 1841 I had under my care, in one of the Government Hospitals of the House of Industry, a patient, Mary Christie, fifty-six years of age, who was disabled from earning her bread, from having had for some years chronic rheumatic arthritis in both her knee-joints. She was suddenly seized with an attack of acute arthritis in the right knee, attended with violent fever, which in a few days terminated fatally. In this case the inflammation did not go on to sloughing of the integuments and synovial sac, as in the case of Sheridan. Mr. (now Professor) Smith made for me the dissection of the right knee-joint in this case, and he laid the following results before a meeting of the Pathological Society.

“The right knee-joint was greatly swollen, and when the capsule was opened, purulent matter escaped. The synovial membrane was here and there lined with buff-coloured coagulable lymph,\* and elsewhere presented an intensely red colour. In some parts the cartilages were removed altogether, their places having been supplied by a porcellaneous

deposit, grooved in the lines of flexion and extension. The cartilages of the tibia were raised up from the articular condyles of this bone, and seemed to be converted into a thin, flexible, yellow membrane. The interior of the tibia, its cancellated tissue, the medullary membrane of the cancelli, and of the medullary canal itself, all presented evidence of their having been the seat of acute inflammation."

Although it is necessary for us to bear in mind the possibility of our encountering occasionally cases of chronic rheumatic arthritis terminating as the two immediately preceding, still, I feel I may confidently say that such examples may be regarded as exceedingly rare.

On reviewing the cases of chronic rheumatic arthritis of the knee, and considering the pathological specimens of it, which I have already adverted to in the foregoing pages, we may, I think, find it convenient to arrange all these cases, as well as specimens, under three heads.

1. I would present to the notice of the reader the two cases\* of James Lynch and Mary Sheridan, as illustrations of the first category of these examples, in the account of which we have not only entered into a full detail of the clinical history of each, but have, moreover, given a description of the post-mortem appearances of the interior of the affected joints, whereby the true relation may thus have been seen, which had existed between the

\* Pages 382 and 391.

symptoms the patient suffered from during life, and the phenomena which the post-mortem examination, in each case, had exhibited.

2. Let it also be borne in mind, that there is a second class of examples of chronic rheumatic arthritis of the knee to be noticed—which class is represented by well-marked pathological specimens of this disease, and by these specimens only, unaccompanied with any clinical history whatsoever of the case; nevertheless, the post-mortem appearances of the affected joint in this class, in the present advanced state of our knowledge of the pathological anatomy of the disease, sufficiently attest the specific nature of it.

As illustrations of this second category of this affection, I would refer the reader to accounts given in the preceding pages of some remarkable pathological specimens of knee-joints of individuals who, as these specimens show, evidently had been affected with the disease we now know to be chronic rheumatic arthritis. One of these I have mentioned is contained in the Museum of the College of Surgeons of England, presented by the late Sir Wm. Lawrence. I have also called attention to a similar specimen, which is preserved in the University Museum of Halle, in Germany. And to this we may add other examples: among these we may be permitted again to allude to that remarkable one, of which we find a graphic account among the Hunterian manuscripts, dated now more than a hundred years ago, which singular memo-

randum proves that John Hunter took an interest in drawing attention to the morbid anatomy of this disease, which, however, he has not named—a disease we *now* call chronic rheumatic arthritis. Under this second category of examples of this chronic disease (that is, where nothing can be ascertained beyond what the post-mortem appearances declare) we may also refer to some examples of specimens delineated in the “Museum Anatomicum” of Sandifort.\*

Mr. Edward Hamilton, Surgeon to Dr. Stevens' Hospital, very lately produced before the Pathological Society of Dublin a remarkable example of this class of specimens, the result of chronic rheumatic arthritis of the knee. In this example was to be seen the usual result of the chronic synovitis of this special disease of the joint, which had existed, viz., the congested fimbriæ, the synovial membrane of the knee distended with fluid, and the popliteal bursa dilated, to which we may add, the eburnation of the bony articular surfaces, the osseous “vegetations” attached to the margins of the articular surfaces of the condyles of the femur and tibia, the great hypertrophy of the patella, and the numerous additamentary bones which seemed to spring from the circumference of the bone.†

Although the clinical history of each of these last-mentioned specimens belonging to our second

\* Sandifort, vol. iv., Table 29; also page 214 of this Treatise.

† Pathological Society of Dublin, vol. iii., 1868, page 36.

category was altogether unknown, no one acquainted with the ordinary anatomical characters of this disease, which it is the object of this work to delineate, can doubt that these morbid specimens of knee-joints here adverted to, were the results of chronic rheumatic arthritis.

3. As an illustration of the third category of cases (in which the symptoms of this chronic disease have been under observation for years, but where no opportunity had occurred of verifying, by a post-mortem inquiry, the morbid anatomy of the affected joints), let me now adduce the following case :—

### CASE XX.

CHRONIC RHEUMATIC ARTHRITIS OF THE CONSTITUTIONAL FORM, OF ABOUT FORTY YEARS' STANDING—THE JOINTS OF THE HANDS, WRISTS, ELBOWS, AND KNEES WERE CONTRACTED AND PAINFUL—NUMEROUS VERY LARGE PENDULOUS MOVEABLE BODIES COULD BE FELT IN THE INTERIOR OF EACH KNEE-JOINT—BOTH PATELLÆ WERE DISLOCATED COMPLETELY OUTWARDS, RENDERING THE ERECT POSITION OF THE BODY IMPOSSIBLE—THE SYNOVIAL SACS OF THE KNEE WERE, AT FIRST, DISTENDED WITH FLUID, WHICH AFTERWARDS BECAME ABSORBED.

MRS. CASSIDY, when she first consulted me in August, 1830, was about sixty years of age. She stated that she had for the last twenty-five years laboured under a most afflicting disease in all her joints, which, from the appearance of her wrists

and hands, it might at once be pronounced to be chronic rheumatic arthritis of the worst form. She complained particularly of her knees, which had been painful and semiflexed for years. She added, that she had been advised to use crutches, but found that she could not, by any effort of her own, or by the assistance of another, stand up or straighten her limbs at the knee-joints.

The knees were much distended with synovial effusion, which had taken place within the joint, in which could be felt numerous foreign bodies of considerable size, and quite moveable. The patellæ of both sides were dislocated completely outwards on the lateral aspect of the outer condyles of the femora ; hence, the knee-joints remained flexed at a right angle, and any effort of the muscles to extend the limbs increased only the degree of flexion.

This lady had consulted almost every medical man of eminence in Dublin, and had communications made by letter with some in London ; and I can testify that any suggestions made as to treatment were scrupulously attended to here. The disease, nevertheless, pursued its slow course unalleviated. Although Mrs. C. remained principally at her residence in the interior of the country, she occasionally visited Dublin or its vicinity, and she gave me many opportunities of witnessing the course of her case ; and she occasionally, when at her country house, communicated with me by letter. As I have one of these letters by me, and as

it gives a graphic account of her occasional feelings, I here quote her letter :—“ The pains I suffer every night are not to be described. Between one and two o'clock in the morning, on awakening, I actually scream out (without being able to suppress it), so that I can be heard by those far from me. I seldom get half-an-hour's rest at a time until six o'clock in the morning. I am never without the composing pills\* ordered by you in January, 1833, taking them generally four times a week, and seldom anything else in the shape of medicine. You could scarcely suppose how good is my general health. I think it right to mention, that the swelling in my knees is so much reduced, that now they are little more than of a natural size.”

She was naturally of a cheerful and active disposition, and at an early hour, each day, had herself carried from her bed-room, and when free from pain, as she frequently was in the day, she enjoyed the society of her family and friends. She drove out much in the open air, and, happily, her circumstances in life were such as enabled her to procure every species of vehicle she required or wished for. Although it was frequently suggested to her, that she, possibly, might derive some advantage from so-

\* The pills she speaks of as having afforded her relief were composed as follows :—

- R. Pulv. Ipecacuanhæ Compositi scrupulum.  
 Extracti Opii aquosi grana duo.  
 Ft. Pilulæ quatuor, duæ nocte sumendæ.

journing, for a time, at some of the watering places in England, or on the Continent, which had obtained celebrity for being useful in cases of affections of the joints, still, she never adopted the advice given ; but, every year, she removed, for about two months, from the interior of the country to the neighbourhood of the sea-side, generally to Kingstown : and there cannot be a doubt but thereby her general health became much improved ; and, under such circumstances, her local pains became much alleviated.

At the age of 76 she died of a complaint totally unconnected with the chronic disease of all her joints, under which she had so long laboured, affording an example of the truth of Haygarth's observation, that this disease does not shorten the duration of life ; and the account we have given of her case would also seem to justify the remark of Sir Benjamin Brodie, that "the patient who is afflicted with this disease, although a cripple, dependent on others for the means of locomotion, may live for years, reconciled to calamities which have gradually come upon him, and in the possession of a certain amount of comfort amid all his sufferings."

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The following are additional cases of chronic rheumatic arthritis, exemplifying this disease as it affects the ankle-joint, as well as some of the smaller articulations of the feet :—



## CASE XXI.

CHRONIC RHEUMATIC ARTHRITIS OF BOTH ANKLE-JOINTS,  
WITH BONY VEGETATIONS AROUND, AND FOREIGN BODIES  
WITHIN, THE ARTICULATIONS.

MR. J. B., a tall healthy looking gentleman, aged 74, whose usual place of residence is London, called upon me on the 16th of August, 1868, to have my advice relative to a severe chronic disease of both ankle-joints, with which he had been affected for the last four years. The joints were much swollen, not by a uniform swelling surrounding the ankle, but there were to be seen, corresponding to the front of the outer and inner malleoli, protuberances, each nearly as large as an ordinary hen egg. Some of these protuberances were hard (as it were bony): others were soft, and presented to the touch a sense of fluctuation, showing that these last-mentioned protuberances were formed by over-distended synovial bursæ developed here. At the first sight of both limbs, one would feel for a moment impressed with the idea that a transverse fracture of the bones of the leg, about one inch above the ankle in each limb, had occurred; and that a line of callus had marked the clumsy reunion of the bones.

When we view the limbs in profile (if we can say so), we perceive that there is a slight displacement, backwards, of the bones of the leg, on the superior articular surface of the astragalus—in a word, the bones of the leg seem placed, as to the

foot, a degree farther back than usual: hence, the heel appears shortened, and the length of the foot, as measured on the dorsum of it, seems, in both



FIG. 35.

Chronic Rheumatic Arthritis of ankle-joint in the case of Mr. J. B., enlarged bursa, bony vegetations around, and foreign bodies within, the joint. Both ankles were similarly affected.

feet, to be preternaturally elongated: the measure of the limbs round the ankle-joints amounts, in

each, to thirteen inches. When we examine deeply these joints we can distinctly feel "foreign bodies" within them; some of these are very small, about the size of peas; but on examining below the outer malleolus of the left limb, one foreign body, as large as a hazel nut, can be felt to slip under the pressure of the fingers. There is crepitus felt and heard on motion of the joint, and the patient complains of occasional pains in the ankles: he does not suffer if he remains in bed or on a sofa: he complains of stiffness in the joints when he first attempts to move about in the morning, yet he adds that, when he perseveres in walking for a little, his movements become much freer, and he suffers less and less as he proceeds.

It is exceedingly painful to him to *stand*, even for a short time, yet he can walk about very well on the level, and can also, without difficulty, ascend a staircase, but in *descending* he suffers much. He has no affection whatever of any of his other joints.

As to the previous general history of his case, we learned that he had always led a very active and healthy life, and was accustomed to much exercise, particularly during the winter months, when he always "rode in" with the hounds, even up to a very short time ago, when he gave up entirely horse exercise. As to the cause of the origin of the complaint in his ankles, he is not acquainted with any he can refer to, if it were not that a great many years ago, while running along a street rapidly, he fell, spraining severely one of his ankles (the

left), and that the same kind of accident has occurred to him more than once ; he never treated these sprains in the usual way, by rest, &c., but applied a bandage, and walked about as if no accident had occurred ; he has also to observe that, ever since his present disease commenced in the ankles, it has gradually increased, up to the present moment, and one ankle seemed affected exactly in the same manner as the other.

In reply to my inquiry as to what diagnosis had been made as to his disease by his ordinary medical attendant, and as to the treatment he suggested, Mr. B. said that he had no ordinary medical attendant, nevertheless he had not altogether neglected to have advice as to his disease, and added, that on one occasion he sent for an eminent surgeon, and, having asked his opinion as to what he considered the nature of his case, "he, on looking at both my ankles, gravely told me that I must at one time or another of my life have met with fractures of the bones of both limbs, just above the ankle-joints, and hence the deformity, congestion of the joints, and the pain felt in progression, were to be accounted for ; but when the surgeon was informed that no such accident had ever occurred to me, he said my complaint then must be either gout or rheumatism. My reply was, that I never had what might be called rheumatism in any of my joints, and that I did not see any reason to consider this complaint to be of this nature ; and, as to gout, I never had the acute pains or inflamma-

tion of the ball of the great toe, or any of those sudden attacks of pain followed by intervals of complete ease, that I had known so many of my friends who had been affected with gout to feel; so that I must confess that, considering all these matters, I felt but little confidence in, and could not agree to, the medical opinions and advice given. One day, however, on perceiving something wrong with my eyesight, I called upon Mr. Critchett (the scientific surgeon and eminent oculist); he, after inspecting my eyes, demanded what was the cause of my lameness, and my reply to him was, that I really could not name my complaint: that I had consulted some medical men, and never had yet received any satisfactory opinion as to what was its real nature or name, or as to what was the proper mode of treating it." He added, "Mr. Critchett announced to me that my complaint was Rheumatic Gout or Chronic Rheumatic Arthritis, and that, as the disease did not belong to his speciality, he would not prescribe for it."

Such was the history of his own case, given to me by Mr. J. B., when he called in August, 1868, to consult me relative to it.

Both his ankle joints were similarly deformed, and I had a plaster of Paris cast taken of one of the limbs, and wood-cut, Fig. 35, gives a representation of the right ankle-joint, as viewed in front.

## DIAGNOSIS.

As to the diagnosis in this case, it seems perfectly plain that the disease in the ankles of Mr. J. B. is chronic rheumatic arthritis. It is so far local that it is confined to two joints only. The affection of the joints, as is usual in this disease, is symmetrical—one deformed joint is a “*fac simile*” of the other. The usual bursal swellings in the vicinity of the diseased joints, as well as the exostotic growths or bony vegetations around them—the pain the patient experiences when he *stands* for any length of time, and the ease he obtains when he sits down—the stiffness of the limbs when he first moves in the morning, and the improvement in his progression when he perseveres—the facility with which he can walk on a level or even ascend a staircase, and the great difficulty he experiences coming down the stairs ;—the whole of this detail reminds us of the history of the case of Michael Leonard (Treatise, p. 356), and it points out that of Mr. J. B. to be a somewhat similar case of chronic rheumatic arthritis, but that in this last case the ankles are the only joints affected.

## PROGNOSIS.

The prognosis to be formed in the case of Mr. J. B. is very unpromising. The joints are much enlarged : the bony vegetations around, and the

synovial swellings, give evidence of much irritation existing within the joints. The ordinary movements of the ankle, viz., those of flexion and extension, are somewhat impeded ; but it is so far favourable that, *as yet*, the lateral ligaments do not permit of any lateral motion ; still, it is my opinion that some abnormal mobility is very likely to come on, if the patient stands or walks much. I may here observe that, after having had two visits from Mr. J. B., to consult me, relative to his case and treatment of it, I soon learned that he had but little faith in medicine, nor did he appear willing to try the effects of a sojourn, for a short time, at Aix la Chapelle, or at Aix les Bains, which I suggested as likely to be serviceable to him. He said he was determined to continue the use of the Turkish bath four times a week, as he considered that he had derived much comfort from it, and that he would not take any other form of bath in England or elsewhere. He added that, although he had come to Dublin to consult me, he could not at present remain, or subject himself to treatment, but that in a month or two he should probably return. I recommended him to use, morning and evening, a liniment composed of the linimentum saponis, in which was dissolved some hydriodate of potass, in the proportion of one drachm of the latter to each ounce of the former ; and as I am persuaded I have often seen good derived in cases of chronic inflammation of joints, from the application of alternate streams of hot and cold water, I recommended the adoption by

Mr. J. B. of douches to his ankles of this description, and that he should, moreover, support the joints with flannel rollers, and every day take exercise on horseback, by which means his general health should be maintained.

As a period of twelve months had just elapsed since I had seen or heard of Mr. J. B., just before going to press (August, 1869) I took the opportunity of calling on his brother (who resides here), to obtain information relative to the course the case had taken during the past year, and all I could learn from him was, that the general health of the patient has remained unimpaired, but that the local disease in his ankle-joints was in no respect better.

The result of the treatment in the case of Michael Leonard, which was already said to be somewhat similar (so far as the ankle-joints were concerned) to that of Mr. J. B., should perhaps encourage us not to despond too much as to his case, but, on the contrary, to make every effort to contend against this treacherous affection of the joints. With regard, however, to the case of M. Leonard, the disease was, it is to be recollected, early recognised, and combated by the means already reported, and which means were perseveringly used, and patiently submitted to, for a very long period in hospital, and hence, perhaps, it has been that the result has proved satisfactory. See page 262.

Finally, to draw to a conclusion this endeavour to exemplify this disease, as it affects the ankle and the articulations of the feet, I shall now introduce



to the reader the following case of a patient, who was recently under observation and treatment in the Richmond Hospital.

### CASE XXII.

OF CHRONIC RHEUMATIC ARTHRITIS IN THE REGION OF THE ANKLE AND TARSUS AND OTHER ARTICULATIONS OF THE RIGHT FOOT—ENLARGED BURSA IN FRONT OF THE ANKLE-JOINT CONTAINING A FOREIGN BODY.

James Foley, aged 33 years, a waggon-porter, was admitted into the Richmond Hospital, under my care, on the 27th of February, 1869, to be treated for chronic rheumatic arthritis, which had engaged the joints of the right foot in so severe a manner that the patient was totally disabled from following his occupation. The right ankle-joint was somewhat stiff and crepitated on motion, and the measurement of its circumference was more by half an inch than that of the opposite ankle.

The right foot was greatly swollen (Fig. 36), and measured round the instep one inch and a half more than the unaffected foot, taken in the same situation. When we range our view along the inner margin of the instep of the right foot, we observe a remarkable projection, corresponding to the situation of the navicular and internal cuneiform bone. (See wood-cut, Fig. 36, p. 425.)

On the highest part of the instep, and immediately in front of the ankle-joint, it was to be observed that there had been developed behind the extensor tendons passing here, a hard inelastic tumour, about the size of a small walnut. This tumour could be made to slip under the pressure of the finger from side to side, and thus handling it caused some degree of pain to the patient. The tumour, it was considered, was formed by one of these cartilaginous "foreign bodies" which had been developed in the interior of one of the normal bursæ which exist behind the extensor tendons, as they pass in front of the ankle. This small tumour was situated over the neck of the astragalus, close to the part where the head of this bone joins the cup of the navicular. The foot seemed somewhat flat, the instep depressed. The medio-tarsal joint of this foot possessed but little mobility. The large joint of the great toe was deformed, the great toe itself was pointed much outwards, three of the smaller toes external to it were much arched towards the dorsum of the foot; and the joints of the several phalanges all presented the usual characteristic nodosity. (See wood-cut, Fig. 36, p. 425.)

Upon inquiry, we found that the patient's mode of progression was characterized by a want of elasticity; he walked much on his heel, and stated that it was a relief to him to throw his weight as much as possible on the external edge of the affected foot. The special symptoms this disease presents, when

in this locality, were well exemplified in his case by the manner in which he came *down* stairs. He descended each step abruptly, making much noise, and in his sudden descent, throwing his weight altogether on the heel. He could ascend the stairs, as already mentioned, with facility, but felt much pain and difficulty in descending. We learned from him that, when in the course of his laborious occupation he had to carry any heavy weight down stairs, he adopted the expedient, whenever he could, of descending backwards, his face towards the steps. It should be remembered that a well-marked crepitus is to be felt and heard, when we seek for it, in the movements of the ankle, the tarsus, and other joints of the foot. When asked as to how far the pains he suffers in the right foot are influenced by the weather, he replies that he knows when rain is coming by his then having some increase of rheumatic pains in the right foot. In general, however, when he is in bed, or remains at rest, he has no unpleasant sensation in it; nor does he feel, under any circumstances whatsoever, rheumatic pains in any of his joints, except in those of his right foot.

When we compare the right, or affected limb, with the left, we find the right, as to the calf, somewhat reduced, but that the ankle measures more in its circumference than the sound one does, and that the foot is of a somewhat higher temperature, particularly in the instep, where swollen. As to the cause of the origin of this disease in the right foot and ankle, in this case of Foley, it appears that

he was (most unfortunately for himself) a most energetic carrier of very heavy burdens ever since he was fifteen years of age. He did not, however, seem to suffer from overwork until about two years ago, when he became affected with this chronic rheumatic arthritis of the ankle and of the joints of the foot. At first the attack seemed to be ordinary inflammation, the result of too much labour, and that such was the simple source of the swollen state of the foot, but subsequently, the patient continuing to work, and to be subjected to damp and cold, the characteristic features of the disease, as already described, manifested themselves.

#### TREATMENT.

As the patient had been kept daily at hard work before he was admitted into hospital, and well fed, and his condition was in no respect lowered by his local complaint, it was deemed advisable to put him at once on an antiphlogistic regimen and treatment. An active aperient was administered to him, and four leeches were applied to the instep of the right foot, and when these fell off, the orifices they made were allowed to bleed for many hours into a poultice. The effects of all this, particularly the rest from labour, and the bleeding (which was somewhat more than was intended) were to lessen pain, and to produce a marked improvement in the appearance of the foot.

Mr. Browne's notes on the Hospital cards, dated the 5th of March, state that Foley was placed this day, as to treatment, on the Chelsea pensioner electuary (see page 318); and, as a local application to the foot and ankle, he was desired to rub in the unguentum iod. potassæ assiduously—and this simple internal and external treatment he continued daily without intermission for one month, viz., until the 6th of April; and at this last date he found himself so free from pain, that, although recommended to remain somewhat longer in Hospital, where he was free from labour, and under treatment, he stated that, although he felt now compelled by urgent circumstances to leave the hospital, he promised to return, if the improved condition of his right foot which now existed did not continue. On the 18th of July, just before the report of the case was about to be sent to the Press, in conjunction with Mr. W. Browne (the resident pupil of the Richmond Hospital, who noted this case), and Mr. Oldham, who took an interest in it, I examined the right foot of the patient, that I might be enabled to describe its condition, now more than four months since he left the hospital, and I was happy to find that the improvement he had made at the period when he left the hospital had by no means ceased to go on when he returned to his labour, but, on the contrary, the amelioration continued ever since, up to the present date, which, I confess, somewhat surprised me, aware as I was, of the very labo-

rious occupation he had to attend to. He stated that he is still, no doubt, somewhat stiff when he first commences to walk in the morning, and to go up and down stairs, and carry weights on his shoulders, but that after he is at labour for a time he becomes as supple as any of his fellow-labourers in the same establishment with him; and he added, notwithstanding the many unfavourable circumstances he knew he had to contend with in his present condition as a porter, that ever since his last attack of rheumatic gout had been under treatment in the Richmond Hospital, he felt that the swelling became each day somewhat less, while, at the same time, he regained more and more the use of the affected foot, and he now feels it to be so well, that he is confident that he shall be fully able to continue his occupation.

If with a view of ascertaining the degree of improvement the right foot had undergone since the 27th February, the day of admission of the patient, we now compare the cast of the affected foot, taken on that day, with that taken so lately as the 27th of July, of the same right foot, we shall have some idea as to how much its appearance has changed for the better. The projection in front of the ankle, formed by the bursal swelling, is nearly removed; the measure of the circumference of the foot round the instep and sole is one inch less than it was when the patient was admitted. The characteristic deformity and prominency of the scaphoid and internal cuneiform bone still re-

main, but the whole appearance of the foot is much better, and may be said to be reduced nearly to its normal size. All this may be proved by the testimony of the casts which we have preserved;\* or by referring to the engravings on wood, which are representations of these casts.

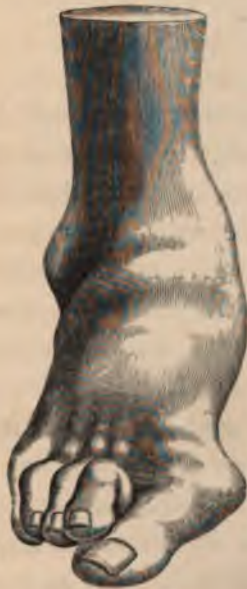


FIG. 36.

Right foot of J. Foley, much swollen; bursa in front of ankle distended; tarsus, metatarsus, and toes affected with chronic rheumatic arthritis; state of the foot on the admission of the patient on the 27th of February, 1869.



FIG. 37.

Same right foot of J. Foley, after having been subjected to treatment in the Richmond Hospital; appearance of improvement the foot presented four months after J. Foley had returned to his work, up to the 24th of July, 1869.

The one, No. 36, the likeness of the foot on the admission of the patient, on the 27th of February, and

\* Case of J. Foley, Museum, Richmond Hospital; see Catalogue, 337.

the other, Fig. 37, that of the same right foot, taken five months later, when the patient had been for weeks fully occupied, and had the satisfaction of finding himself in every respect equal to all his duties as a waggon or van porter.

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Haygarth has started a question relative to this disease, which he has not been able to answer satisfactorily from his own experience, namely, whether "nodosity of the joints" (as he calls it) is ever attended with symptoms which give evidence that the disease is, like true gout, susceptible of *metastasis*; his words are these:—"In two or three cases the nodosity appeared to alternate with a colick of the stomach, *gastrodynia*, and in one instance with *an asthma*. If these few examples of the translation of the disease to and from the viscera be confirmed by future observations, they would prove that the nodes were in their nature more allied to gout than to rheumatism."

As to this observation of Haygarth with reference to metastasis, I have to say, that the following case of Thos. Byrne seems to me to be an example such as Haygarth alludes to. I may here observe that this is not the only case of metastasis of this disease I have seen: there was another quite similar to it under my care in the Richmond Hospital in March, 1837, and accurately noted in our Hospital



Case Book by our excellent clinical clerk of that day, Mr. Bradshaw; but as these two examples are the only ones I have met with, and as in the extensive experience of Haygarth, he says he has witnessed but "two or three" instances of this kind, I think I may safely infer that, although metastasis may occasionally happen in cases of rheumatic gout, and that we should be on our guard against such a contingency, still we have reason to believe that metastasis will be found to be exceedingly rare in the case of chronic rheumatic arthritis. We may indeed well conceive that in cases of true gout the disease may pass from a joint to some one of the internal organs, but the case of chronic rheumatic arthritis likely to be at all susceptible of metastasis, must, I imagine, be one of those seldom, yet sometimes, to be met in which the disease is attended with exacerbations.

The following case, on this as well as on other accounts, may be, perhaps, usefully introduced here:—

## CASE XXIII.

AGGRAVATED CASE OF CHRONIC RHEUMATIC ARTHRITIS—  
FRACTURE OF UPPER PART OF FEMUR FROM A FALL—  
EXACERBATION OF RHEUMATIC GOUT OF KNEE—METAS-  
TASIS FROM IT TO THE INTERIOR ORGANS.

Thomas Byrne, æt. 45, had been for many years sadly afflicted with chronic rheumatic arthritis. From this disease and his great irregularity in his mode of life, he became unable to earn his bread, and was so reduced in his circumstances that he was compelled to become an inmate of the North Union Poor-house. On the 15th of October, 1857, he had been permitted out of the Union on leave for a day, and while walking in the streets with the aid of his crutches, he had the misfortune to fall down on the great trochanter of his right thigh, and to suffer an *extra capsular* fracture of the neck of the bone. He was forthwith admitted into the Richmond Hospital, and placed under my care.

First, then, as to the fracture in this case, I have to say, that neither at the date of the admission of the patient nor subsequently in the course of the cure of the fracture, did the progress of the union of the bone seem at all influenced by the presence of the disease of chronic rheumatic arthritis existing in almost all his articulations; and, secondly, I may observe, that the external form and condition which many of these joints present illustrate in so remarkable a manner the ultimate effects of this disease on the articulations of the hands and feet of the patient,

that I deemed it advisable to procure drawings of them by the late Mr. Conolly, and the woodcuts—Figs. 38, 39, and 40—by Mr. Oldham, are representations of these drawings.



FIG. 38.



FIG. 39.



FIG. 40.

For the first three weeks after the patient's admission into hospital to be treated for the fracture, he went on remarkably well, neither suffering much from the accident nor from rheumatic gout, until

the 23rd day after his admission, when suddenly his right knee-joint was visited with a sharp exacerbation of rheumatic gout in the joint. There was even a slight blush of redness of the skin around the patella. For two days this condition of the right knee of the patient continued without undergoing much alteration; but on the 27th day after his admission for the fracture—viz., the 10th of November—on our morning visit to the hospital, we were informed by the resident pupil that he was called to him during the previous night, and he was made acquainted with the circumstances that the redness and pain suddenly left the patient's knee, and at the same moment he complained of nausea, and vomited a yellow fluid, which he represented as having an intensely bitter taste, complaining also of sudden and griping abdominal pains coming on, followed by the discharge from his bowels of a greenish matter, of the most offensive odour; and the patient stated that the evacuation of this green matter was accompanied with the greatest pain.

The vomiting and diarrhœa both continued for ten days, during the whole of which time the patient slept but little, and complained of griping pains, as before mentioned, in the abdomen. He had intense thirst, a frequent and weak pulse, and hot skin; his tongue was morbidly red, and he had constant erethism of the stomach, a sense of burning heat in the region of it; add to all this, he was occasionally attacked with a difficulty of breathing; to use his own words, he stated "he felt as if the breath were

leaving him." Sips of cold water remained on his stomach best; but sometimes coffee without milk or sugar; cold chicken broth, when given in small quantities, were not rejected.

When this severe gastro-enteric attack, after having lasted for ten days, subsided on the 11th of December, we find noted "the patient states that he now feels himself (though no doubt weak) in much better health than he had been for a long period before he was admitted into hospital;" and the succeeding note in the Case Book, dated the 15th of January, 1858, runs thus:—"The fracture having been firmly united, he left the Richmond Hospital, having been taken charge of by his friends, who for some time afterwards supported him; but it appears he ultimately resumed his former intemperate habits, and they consequently abandoned him to his fate, and he had to betake himself again for refuge to the North Union Poor-house, where he remained uninterruptedly for the last four years of his life, viz.—from the 3rd of November, 1861, until the 29th of October, 1865, at which period he breathed his last; and I was informed, on inquiry at the institution, that the unfortunate patient had been "bedridden" for many weeks before his death, and that it was found absolutely necessary to sustain his failing powers continually with stimulants, and that finally he seemed to sink less from what could be called any special illness, than from total loss of appetite and mere debility. There was no post-mortem examination instituted in the Poor-house.

As to the previous history of this patient, we have to remark, that before he was placed under my care I was informed he was a man originally possessed of comfortable means, and who had lived among the middle classes of society in the south of Ireland; that early in life he became addicted to habits of drunkenness and dissipation; that specially on one occasion, when in a state of intoxication, he lay an entire night in the open air on the damp ground; and that, in consequence, he became severely affected with a rheumatic fever; and that, out of the lingering remains of this acute affection, the chronic disease to which he afterwards became a martyr for the remainder of his life arose.

I have in this work already given many examples of very severe forms of this chronic disease having followed a rheumatic fever, which had itself an evident origin in the intemperance and dissipation to which the person so affected had been previously addicted, and I can refer to the history of Mailly, M'Garry, Donoghoe, and others, all of which have belonged to this fatal category. But although it is quite right that such truths should be registered, I would not be supposed to imply that such excesses should be considered by any means as the ordinary source of the disease in question; on the contrary, my experience has presented me with a far greater number of examples of this disease in patients who, no doubt, may have had rheumatic fever, but who were remarkable for having lived previously in the simplest manner. Many of these

have been respectable females of different classes of society, in whose cases no cause could be assigned for the origin of the disease in their joints, were it not that it might be attributed to a change of their constitution, occurring about the period of the cessation of the menses.

Not to dwell longer on the probable cause of the origin of the disease in this individual, we may, I think, derive some interest in contemplating its ultimate results, and observing how it modifies "symmetrically" the form and figure of the small articulations of the hands and feet in very aggravated cases of chronic rheumatic arthritis.

In the preceding pages (238 and 283) of this work, I have stated that luxation of the basis of the first phalanx of the little finger towards the palm was the most frequent luxation I had seen as a consequence of rheumatic gout. And I have also mentioned that Cruveilhier, *Livraison xxxiv.*, planche 1, gives a case in which the basis of not only one, but of *all* the phalanges of the fingers, were thus dislocated forwards towards the palm. In this case of Thomas Byrne, now under consideration, the bases of the first phalanges of *all* the fingers in both hands, including those of the thumbs, were also thus dislocated forwards (Wood-cuts, 38, 39).

It was very remarkable, with such distortion of the hands and symmetrical dislocation of the phalanges as was here observable, that the patient, at this period of his disease, when he was admitted into hospital, suffered no pain in them, and that he

possessed considerable use of them; and it had been observed that, in ascending or descending a staircase, or walking on a level, he could apply his hands to the crutches, and make use of their help. As to the feet (which were also symmetrically\* affected), we observed that the extensor tendons of the toes, just as they pass near the bases of all the phalanges, are thrown into relief (see Fig. 40) and presented the prominency before noticed in such cases. We were struck, too, with the usual arched elevation of the small toes, and the marked nodosities of all the joints (Fig. 40). The patient, in walking, had been always observed to dwell much on the heel, and that the extremities of the smaller toes did not at each step approach at all the ground.

As to the treatment of the *metastasis* in this case, we have only to say, the sudden cessation of pain and disappearance of redness from the cutaneous surface of the knee-joint, and the equally sudden and simultaneous invasion of gastro-enteric pain, vomiting, &c., &c., were speedily attended to in the hospital during the night, and the ordinary means of exciting counter-irritation on the cutaneous surface of the knee joint were resorted to, but altogether in vain; neither the redness nor pain in the joint could be brought back to the region it had so suddenly

\* As an apology for the frequent use of the term *symmetry* when applied to the deformities indicated, I must refer the reader to the words of Sir Thomas Watson, Bart., already quoted (pages 303-4) in this volume.



left. The erethism of the stomach demanded all our attention for the first few days of the attack, and was treated with two-drop doses of dilute hydrocyanic acid every third hour, and with the effect of palliating the vomiting; and for the dyspnœa, which did not appear until the fourth day, one-drachm doses of Hoffman's anodyne-liquor in water gave some relief to the patient, but a blister became ultimately necessary. As to the checking of the diarrœa, the following mixture seemed to be more useful than any other form of medicine resorted to:—

**R** Infusi angusturæ uncias sex;  
 Acid. Sulphurici Aromatici scrupula duo;  
 Tincturæ Rhataniæ, ʒ i.;  
 Tincturæ Opii gutt. xl.;  
 Syrupi Rosæ semunciam;  
 Coch. ampla duo ʒiis horis.

It may appear somewhat remarkable, that although this patient had been long affected with this chronic disease (his whole system as it were imbued with it for years) the extra capsular fracture of the femur in such a case should not take more than the ordinary period of ninety days after the accident, to become firmly and perfectly consolidated.

## CHAPTER XIV.

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### BURSAL TUMOURS DEVELOPED IN THE VICINITY OF THE JOINTS AFFECTED WITH CHRONIC RHEU- MATIC ARTHRITIS.

SECTION 1.—Although medical and surgical writers have not been inattentive to the consideration of ordinary bursal tumours developed in the vicinity of the joints, they seem to me to have been, with few exceptions, nearly all silent as to a class of synovial tumours which are to be so frequently seen in the vicinity of the joints affected with chronic rheumatic arthritis, that such bursal tumours may, I deem it, be considered symptomatic of this disease existing in the neighbouring joint.

This omission of authors to recognize bursal tumours developed in the vicinity of joints affected with chronic rheumatic arthritis, as symptomatic of this last disease existing in the neighbouring joint, seems to me to be a matter much to be regretted ; for I feel convinced that the clinical history and the anatomico-pathological knowledge of this disease should be found very incomplete, if the true

relation which exists between chronic rheumatic arthritis of a joint and the distended synovial cysts we observe so frequently associated with it, were not fully considered.

To show that authors have not, generally, recognized bursal tumours developed in the vicinity of the joints, as belonging to, or as being symptomatic of, rheumatic gout, I may mention that Haygarth has made no allusion to distended synovial swellings, as belonging to the symptoms of rheumatic gout of a joint; and Sir Benjamin Brodie, although he enumerates among the causes of bursal tumours "rheumatism and other constitutional affections," in my opinion, he must be understood to imply only ordinary rheumatism: because he does not either in his chapter on inflammation of the synovial bursæ nor in that on rheumatic gout, in his work on the joints, make allusion to any connexion whatever existing between the symptoms of rheumatic gout and the development of bursal tumours in the neighbourhood of a joint so affected. More modern authors (for example, Drs. Fuller and Garrod), in their observations on rheumatic gout, do not mention the circumstance, that the distension of the synovial bursæ, in the vicinity of a joint affected with chronic rheumatic arthritis, existed as a symptom of this disease affecting the joint.

The first examples I am aware of, of cases of bursal tumours developed in the neighbourhood of a joint having been brought forward, as giving evidence

of these distended bursæ being symptomatic of any specific irritation extending from a neighbouring joint affected with chronic rheumatic arthritis, have been published in the "London Cyclopædia of Anatomy and Physiology," and these examples have been placed there (many years ago) by the author of the present work.\*

In considering, in detail, bursal tumours developed in the vicinity of the joints affected with rheumatic gout, it may be found convenient to class them into those which are observed to present themselves in the vicinity of the joints of the upper extremity; and secondly, into those to be seen in the vicinity of the joints of the lower extremity.

**BURSAL TUMOURS, SYMPTOMATIC OF CHRONIC RHEUMATIC ARTHRITIS AFFECTING THE UPPER EXTREMITY.  
—SHOULDER-JOINT.**

One of the cases I have recorded as an example of chronic rheumatic arthritis of the shoulder-joint is

\* In the year 1836, Dr. R. Todd, the editor of the London Cyclopædia of Anatomy and Physiology, engaged the author to write for that work several Articles on the *Abnormal Anatomy of the Joints*, which task he performed accordingly; and in these Articles—Shoulder, Elbow, Wrist, Hand, Knee—he exemplified the development of bursal tumours in the vicinity of the joints affected with chronic rheumatic arthritis, by cases he had under his care from time to time in the Richmond and other Government Hospitals of the House of Industry.

that of Charles Maily, æt. 48, who was afflicted with chronic rheumatic arthritis, not only in his shoulder-joints, but also in all his other articulations. In this case, we had to remark, as to both his shoulder-joints, clinically, that the heads of the ossa humeri seemed enlarged and elevated above the level of the coracoid process. After years of suffering, the patient died.

On making the post-mortem examination of the shoulder-joint, "the *sub-deltoid bursa* was observed to be of a yellowish colour, and to have a fibrous appearance somewhat like to a capsular ligament; and, when the bursa was cut into by an incision parallel to the margin of the acromion process, its cavity was seen to be more capacious than usual, and its inferior wall was found to have identified itself with the superior part of the capsular ligament. Both shoulder-joints and both sub-deltoid bursæ presented an exactly similar appearance."\*

Mr. Edwin Canton, of London, who has done much to make the medical men of Great Britain acquainted with chronic rheumatic arthritis, and who is one of the very few who has alluded to the presence of distended synovial bursæ in connexion with this disease, has detailed one instance of a patient of his, named J. Harris, æt. 78, a house servant, who had chronic rheumatic arthritis in almost all his joints for many years. With regard to the condition of the right shoulder-joint of this

\* "London Cyclopædia of Anatomy and Physiology," vol. iv., p. 596.

patient, Mr. Canton observes that, "on applying the palm of the hand over the joint, and rotating the humerus, a well-marked articular crepitus was heard and felt. The patient complained of an incessant dull pain, aggravated by motion, in the joint—the pain extended down the inner side of the arm to the elbow, &c., &c."

On making the post-mortem examination of the shoulder-joint, besides the ordinary anatomical characters of this disease—such as porcellanous deposit, and prolongation downwards of a spongy osseous rim of bone overhanging the anatomical neck of the humerus—the synovial membrane was thickened, and in some places was very vascular, especially so, where it presented engorged and hypertrophied fimbriæ. Besides these ordinary anatomical characters of chronic rheumatic arthritis, Mr. Canton observes: "there existed in this case a *large bursa mucosa* between the capsular ligament and the outer part of the coracoid process."<sup>\*</sup>

ELBOW-JOINT—BURSAL TUMOURS OF THIS ARTICULATION, SYMPTOMATIC OF CHRONIC RHEUMATIC ARTHRITIS.

I have already alluded to a preparation of the bones of the elbow-joint contained in the Museum of the Richmond Hospital. The catalogue, referring

\* "Surgical and Pathological Observations." London, 1865. By Edwin Canton, F. C. S.

to the condition of the joint when recently examined anatomically, contains the following words:—

“ This preparation shows the effects of chronic rheumatic arthritis of the bones composing the articulation of the elbow. The bones are very much hypertrophied, and their articulating extremities altered in form and size: a great number of foreign bodies, some cartilaginous, some bony, existed in the articulation (Atlas, Pl. iv., Fig. 4). The synovial membrane was intensely vascular. A number of vascular fimbriæ projected into the interior of the joint. *The bursæ in the vicinity of the articulation were enlarged.*”\*

## CASE XXII.

BURSAL TUMOURS OF THE ELBOW-JOINTS, SYMPTOMATIC OF  
CHRONIC RHEUMATIC ARTHRITIS—THE DISEASE, OF THE  
CONSTITUTIONAL FORM.

Among the patients who were inmates of the Poorhouse Department of the House of Industry Hospital, in January, 1836, there was a woman named Catherine Macan, æt. 80, under my care, affected with chronic rheumatic arthritis of the constitutional form—a disease with which she had been afflicted for many years; her elbows, especially, attracted attention. They were much swollen, exhibiting the appearance of an hydarthrosis in each articulation; besides, on their

\* “ Catalogue of the Museum, Richmond Hospital,” No. 313.

lateral aspect, these joints were deformed by having placed there small prominent bursal swellings the size of pigeons' eggs. Behind the right elbow, corresponding to the back part of the olecranon process of the ulna, there was a small prominent bursal sac distended with fluid, in which could be felt small foreign bodies. The left elbow-joint was nearly immovable, and in a state of forced supination: the right possessed all its movements, although they were attended with pain, and they exhibited the characteristic crepitation of the disease.

Considering the extreme age of the patient, and the length of time she had been afflicted in all her joints by this chronic disease, it was thought useless to subject her to any treatment. She sank, at last, under her age and infirmity, in October, 1837.

POST-MORTEM EXAMINATION.—*The elbow-joints.*—When the integuments were removed from the external surfaces of the joints, it could be perceived that the capsular ligaments, which were remarkably thin and transparent, contained within them a yellow fluid, which was found, on opening the synovial sac, to be thick and of an oily nature. Small bursal swellings were also observed on the lateral aspects of both joints, which, when carefully examined from within, were found to be quite isolated ganglions, having no communication with the interior of the synovial sac of the elbow-joint.

The distended subcutaneous bursa behind the olecranon process, when opened, was found to contain about one ounce of a yellow, oily fluid, similar



in appearance to that which the external cysts and the synovial sac also, of the elbow-joint had contained. This dilated bursa of the olecranon process was occupied by small foreign bodies, such as those we are familiar with, as being found in bursal tumours in general.

Mr. R. Smith, now Professor Smith, T. C. D., F. R. S. (then a pupil), assisted me in making the post-mortem examination in this case, and almost all the bones of the patient have been preserved in the Museum\* of the Richmond Hospital; and, if these be examined at the present day, they will be seen to present throughout the characteristic marks of the constitutional form of chronic rheumatic arthritis. They are almost all in a state of atrophy, and are remarkably light: for example, when the bones of the left forearm are placed on the surface of water, they float. The heads of the ossa humeri present the usual well-marked effects of the disease; and the tendon of the biceps, in the preparation of the dried bone of the left humerus, shows the usual adhesion of the tendon to the summit of the bicipital groove. The absence, too, of the intra-articular portion of this tendon may be also noticed—a circumstance we are familiar with, as a constant effect of this disease (see Atlas, Plate III., Fig. 3). The cartilage of encrustation has been removed from the heads of the ossa humeri on both sides, and the head of the right os humeri is *eburnated*. We

\* See "Catalogue," No. 22, Case of C. Macan, Index.

found that all the bones of the lower extremities were more or less marked by the effects of this peculiar disease ; and I may mention that, although in the first edition of this work I have not introduced the history of this case, I had placed a lithographic drawing in the Atlas of the work, representing the condition in which the bones of her knee-joint, after maceration, were found in ; and to this plate, and explanation of it, I can now refer, as giving a graphic illustration of the state of the bones of her knee-joint (see Atlas, Plate VIII., Fig. 1).

Although the two preceding cases have been brought forward principally with a view to exemplify the circumstance, that bursal tumours are occasionally to be found around the elbow-joint, when affected with chronic rheumatic arthritis ; still we should not, we think, omit here to observe, that these two cases might also be considered interesting to be contrasted with each other—the one\* first mentioned as exhibiting the elbow-joint affected with the local form of the disease, in which the bones were much hypertrophied ; the other, on the contrary (C. Macan), exhibiting the constitutional form of this disease, in which the bones were in a remarkable state of atrophy.

\* Museum, Richmond Hospital, No. 313. Atlas, Pl. IV., fig. 4.

WRIST-JOINT—BURSAL TUMOURS, SYMPTOMATIC OF  
CHRONIC RHEUMATIC ARTHRITIS HAVING AF-  
FECTED THE WRIST-JOINT, TO BE SEEN IN THE  
NEIGHBOURHOOD OF THIS ARTICULATION.

Some of these dilated bursæ frequently present themselves on the dorsum of the carpus, and occasionally are to be found in front of the wrist-joint. As for a specimen of distended bursæ on the dorsum of the carpus and lower extremity of the radius, symptomatic of rheumatic gout of the wrist, I may refer to the Atlas (Plate x., Fig. 3), in which plate are delineated the hand and wrist-joint of one of our patients—an old person—in whom the bursæ on the back of the wrist were much dilated, and the articulations of whose hands were deformed and characteristically affected by the nodosity of chronic rheumatic arthritis, as the lithographic drawing well exhibits (Plate x., Fig. 3).

I have here to remark, that it is not on the dorsum of the carpus only, that these bursal swellings symptomatic of chronic rheumatic arthritis, are to be seen ; for I have fully ascertained that bursal tumours on the front of the region of the wrist, of the same nature as those of the dorsum, are occasionally observed.

SYNOVIAL TUMOURS FORMED BY THE DISTENDED  
BURSÆ OF THE TENDONS OF THE FLEXOR MUSCLES  
OF THE FINGERS, SYMPTOMATIC OF RHEUMATIC  
GOUT.

Some time ago,\* in the pages of the "London Cyclopædia of Anatomy," I had to make some observations on the abnormal anatomy of the bursæ of the tendons of the flexor muscles of the fingers; and, on referring to the supposed causes of the occasional morbid condition of these bursæ, I have stated, that a fall on the palm of the hand, or other external violence, might cause effusion into the bursa of the tendons of the flexor muscles of the fingers, and thus form a swelling on the anterior part of the wrist; but I added, that I had known an example of one of these tumours to have made its appearance without having been preceded by any violence or external injury, but that the constitution of the patient in the case in question was decidedly of the rheumatic character. Subsequent experience has enabled me now to speak more positively as to this point; for I have since seen many cases of chronic rheumatic arthritis of the wrist accompanied by more or less of effusion into the synovial bursæ of the tendons of the flexor muscles of the fingers. At the present moment (August 11, 1871), there are under my care two patients in No. 8 Ward, Richmond Hos.

\* September, 1852. See "London Cyclopædia of Anatomy and Physiology," vol. IV., p. 1528.

pital, viz., Bridget Lynch, æt. 50, and Margaret Frazer, æt. 63, each affected with the constitutional form of chronic rheumatic arthritis. Each of these cases presents us with the example of the oblong bursal tumour in the front of the lower part of the forearm, wrist, and palm—one in the right, the other in the left upper extremity. These oblong tumours, slightly constricted in the situation of the anterior annular ligament of the carpus, seem to me to differ in no respect from the ordinary bursal tumours of the tendons of the flexor muscles of the fingers, so far as to their own proper form and symptoms. But it is to be observed, that these well-marked bursal tumours are seen associated in the cases under contemplation, with the well-characterized symptoms of rheumatic gout in the neighbouring joints—the wrist and fingers—which are found in a state of nodosity.

I may further add, that we possess in our Museum in the Richmond Hospital a plaster cast of the forearm and hand of an adult man, who had laboured under this distended condition of the bursæ of the flexor tendons of the right forearm. The cast, also, of the hand shows us, that the patient from whom it was taken, besides labouring under the bursal swelling in the forearm and wrist, had also been affected with rheumatic gout of the hand, which was strongly adducted towards the ulnar side. The fingers were in a state of distortion and nodosity. There is also seen the usual enlargement of the carpal joint of the thumb, and the marked state of extension of its unguinal phalanx.

As the patient from whose hand and forearm the plaster cast had been taken had not been an inmate in our hospital, the history of the case which could be collected was brief, and consisted in the



FIG. 41.

Rheumatic gout of the wrist and finger-joints, with nodosity, symptomatic of chronic rheumatic arthritis.

following words, which are noted in the Catalogue of our Museum, as follows :—

“Effusion into the bursa in front of the wrist ; the tumour is constricted in the situation of the annular ligament. Treatment: it was slit up ; violent inflammation and gangrene ensued. Amputation.”\*

BURSAL TUMOURS, SYMPTOMATIC OF CHRONIC RHEUMATIC ARTHRITIS AFFECTING THE JOINTS IN THE LOWER EXTREMITY.

As we have had examples of bursal tumours symptomatic of chronic rheumatic arthritis in the

\* No. 303, Page 73, “Catalogue of Casts, Museum, Richmond Hospital.”

shoulder-joint, we may infer the probability of an analogous state of things being likely to present itself under the influence of analogous causes affecting the hip-joint; and indeed, when we reflect on the frequency of rheumatic gout of this joint, and bear in mind the numerous bursæ which, in the normal state, surround it, and some of which accompany the tendons to their insertion into the bones—when we consider all this, we cannot doubt but that hereafter, when the anatomical characters of the disease shall be more generally investigated, bursal tumours shall be found developed around the hip-joint, symptomatic of rheumatic gout of this articulation. I must confess, however, that I have not myself had any opportunity of witnessing bursal tumours of the class I allude to about the hip, nor have I found such lesions recorded by others; so that any further observations I shall have to make, relative to bursal tumours developed in the vicinity of the joints of the *lower extremity*, symptomatic of chronic rheumatic arthritis, must be limited to those bursal swellings we observe to be in connexion with the articulation of the knee and ankle.

*Ankle-joint.*—As to this last articulation, I may observe I have already, in the immediately preceding pages, noticed the existence of bursal tumours in connexion with this joint when affected with rheumatic gout. In one of the examples (Mr. J. B.) I have brought forward, and illustrated by a wood engraving (Fig. 35), the lesion was observed to be double or symmetrical; and in another (that of J. Foley),

only one of the ankles was affected. As to the details relative to these cases, they may be found by the reader turning to page 412.

KNEE-JOINT—BURSAL TUMOURS IN THE VICINITY OF  
THE KNEE-JOINT SYMPTOMATIC OF CHRONIC RHEU-  
MATIC ARTHRITIS.

As the bursal tumours we see around the knee-joint are generally observed to be the normal bursæ of the region developed by some form of inflammation into fluctuating swellings, we may readily infer that those tumours may be found most frequently to make their appearance either in the middle line in front of the knee, or if in the ham, posteriorly, close to the borders of the popliteal space ; for it is only at the borders of the region the normal tendinous bursæ of the space exist. But here let me observe, that although I have thus stated that bursal tumours seen in the vicinity of the knee-joint are *generally* found to be the normal bursæ morbidly developed into fluctuating tumours, I would not be understood to assert the rule to be universal, and without any exception—indeed, in the preceding pages I have already brought forward the case of a patient, Mary Sheridan, who was for a long time and severely affected with chronic rheumatic arthritis of the knee, and in the history of whose case it was stated that a distended and thickened synovial sac, A, containing small foreign bodies, was observed to be placed obliquely across the upper extremity



of the tibia, beneath the point of the insertion of the ligamentum patellæ (Fig. 34), and they occupied a situation which does not belong to any normal bursæ anatomists are acquainted with (Woodcut, Fig. 34, page 100).

Among the normal bursæ we see developed into tumours in the vicinity of the knee-joint, we notice the bursæ of the patella to be more frequently affected from external causes than any of the synovial sacs about the knee ; but we may here remark that it is not from external causes only, that this bursæ thus becomes developed into a tumour ; for it is certain that it is occasionally distended by synovia into the form of a bursal tumour, symptomatic of chronic rheumatic arthritis of the knee-joint, and in cases too, in which the disease is of the constitutional form. For example, a woman before mentioned (Bridget Lynch, æt. 50) is at present (September, 1870) under my care in the Richmond Hospital, ward No. 8, who has rheumatic gout, implicating almost all her articulations, viz., those of her knees, wrists, hands, and feet, and when we examine the bursa of the right patella in her case, we observe it to be dilated into a fluctuating swelling, having no tendency to suppuration, and we can, moreover, detect many small "foreign bodies" about the size of split peas, which can be freely moved about in the interior of this dilated bursæ.

BURSAL TUMOURS PRESENTING THEMSELVES IN THE  
HAM SYMPTOMATIC OF RHEUMATIC GOUT OF THE  
KNEE-JOINT.

*Sect. 1.*—Preparatory to the special consideration of this subject, it will, I think, be found convenient to bring to mind, that in the normal state there are to be found by dissection in the popliteal space five synovial bursæ—three small ones, placed externally, near to the outer hamstring ; two more important placed close to the inner margin of the region. The three external normal bursæ are of a rounded form, and when examined anatomically and inflated, they seem not larger than filberts, yet they are said to be capable, under morbid influences, of attaining greater magnitude, but they are not constantly to be found on dissection.

At the inner margin of the popliteal region we meet with, in dissection, two bursæ—one is small, not larger than an almond, is situated inferiorly, and belongs exclusively to the semi-membranosus muscle ; it does not communicate with the interior of the knee-joint. The other, the larger bursa of the semi-membranosus, is situated superiorly to that last mentioned. When we examine anatomically the larger bursa of the semi-membranosus, we observe it to be, when inflated, about the size of a small hen egg ; that it is of an ovoidal form, its greatest diameter being vertical ; this, the larger of the two synovial bursæ, connected with the semi-

membranous muscle, is placed between this muscle and the internal gemellus, where these muscles decussate with each other. This bursa of the semi-membranosus, is by far the most important of those which make their appearance in the ham: it is found in the adult usually to communicate with the interior of the knee-joint: when we make an opening into this bursa, and inspect its interior, it appears to be formed into a multilocular cavity, and the opening by which it communicates with the synovial sac of the knee-joint to be of a valvular nature.

When this synovial bursa becomes affected with any form of inflammatory action, it soon becomes distended with fluid, and dilated into a tumour, which is projected backwards, and becomes prominent behind, and towards the inner side of the popliteal space. (See Atlas, Plate IX., Figs. 1 and 8.)

Under such circumstances, the fundus or basis of this synovial sac may at first sight *appear* to occupy the middle line, so as to lead to the conjecture that the bursal swelling was protruded directly backwards, through the centre of the *Ligamentum posticum* of the knee-joint; nevertheless, I must say, that I find that all the clinical notes we have ourselves taken down, or observed detailed by others, of these bursal swellings of the ham, state that these tumours have been observed to be situated habitually nearer to the inner than the outer hamstring muscle; and all the

anatomico-pathological reports we read of these popliteal cysts inform us that the neck of the cyst was traceable upwards and inwards towards the insertion of the inner hamstring muscle, where the cyst will always be found, by its anterior extremity, to be intimately adherent to the tendon of the internal hamstring. As this bursal tumour gradually enlarges, it becomes more prominent behind in the popliteal space, and may ultimately be found to have attained the size of an orange.

As to the *symptoms* this tumour (into which the larger bursa of the semi-membranosus is converted) presents, we notice that the skin covering its surface is smooth, and without discoloration. The swelling is observed to be tense, when the patient is standing erect; but when the knee is flexed, the fluid contents of the bursa pass into the interior of the joint, and at such a moment fulness at each side of the ligament of the patella occasionally becomes manifest. Thus we can perceive, from clinical examination alone, that a free communication exists between the distended synovial bursa we are here considering and the cavity of the knee-joint itself; and such is the continuity of the interior surfaces of the two cavities, that we can readily comprehend, when the cavity of one of these synovial sacs is distended, that under slight pressure the fluid will readily pass from one synovial sac into the other, and thus afford us an opportunity of seeing combined with the distended bursa of

the semi-membranosus in the ham an *hyarthrosis of the knee*.

Many years ago I publicly expressed my opinion, that the bursa of the semi-membranosus we are here considering was very frequently developed into a bursal tumour, which presented itself in the popliteal space, and that such swelling, in this situation thus formed, was very usually found to be associated with well-marked symptoms of rheumatic gout of the corresponding knee-joint.

This doctrine I maintained in the clinical lectures I delivered in the Richmond Hospital, so far back as during the Winter Session of 1836-7, and supported it by referring the clinical class to cases which at that time I had under my care in the Institution.\*

In concluding this section relative to bursal tumours of the ham, *symptomatic of rheumatic gout of the knee*, I may perhaps avail myself of the occasion to observe, that modern authors who have published essays on bursal tumours of the ham seem quite to have overlooked two communications referring to the subject, long since published, and which ought not, in my opinion, have been passed over in silence by any modern writer on bursal tumours of the ham.

The first of these publications is a clinical lecture delivered by the late Sir William Laurence, in St. Bartholomew's Hospital, during the Winter Ses-

\* See case of P. Donohoe, "Lond. Cyclop. Anat. & Phys.," vol. iii., p. 58; also, "Atlas," p. 9.

sion of 1836-7. I believe this communication may be considered the first notification to the profession of the existence of such a disorder as bursal tumour of the ham, and which communication I shall presently have occasion to recur to.

As to the second publication, I have to state that I have myself, many years ago, in the article *Abnormal Knee-joint*, in the "London Cyclopædia of Anatomy and Physiology," entered very fully into the consideration of one form at least of bursal tumours of the ham; and I think I may, by a quotation from the text of the work, be enabled to show that this article, published more than thirty years ago, contains everything positive which can at the present day be advanced relative either to the description of the external symptoms or the anatomical characters of bursal tumours of the ham.

The words of the text of the "London Cyclopædia," in the article in question, "Abnormal Knee," are as follow:—"A tumour, about the size of a small hen-egg, is to be seen projecting into the popliteal space. This tumour reaches towards the inner head of the gastrocnemius muscle. It disappears when the knee is flexed, and becomes more tense and hard when the limb is in the extended position, as when the patient stands erect. We have known several cases of this disease, in which this dropsical condition of the popliteal bursa existed as one of the symptoms of rheumatic gout, and the patient having had this chronic disease in both the knee-joints, the dilated bursæ were

seen in both popliteal spaces, presenting in each case, on a superficial inspection, the resemblance to one of double popliteal aneurism."

Moreover, in the same article, *Abnormal Knee-joint*, in the "Cyclopædia," I have stated that I had opportunities of ascertaining, by dissection, the actual condition of the distended popliteal bursa in these cases, and from these opportunities I was enabled to report as follows:—

"The popliteal tumours we find, on dissection, to be what we might have surmised — an enlargement and dropsical condition of the bursa which naturally exists at the point of decussation of the semi-membranous tendon with the tendon of the internal head of the gastrocnemius. This bursa communicates, normally, with the synovial sac of the knee-joint by a very small circular aperture. It is not an uniform ovoidal sac, but evidently has semi-lunar septa irregularly thrown across its interior, making the bursa a small multilocular cavity."

Thus, then, it is evident that the external signs and symptoms, as well as the anatomical characters of these bursal tumours, presenting themselves in these popliteal regions, considered as symptomatic of chronic rheumatic arthritis, were accurately described, more than thirty years ago, by the author of the present treatise.

CONTINUATION OF THE CONSIDERATION OF BURSAL  
TUMOURS OF THE HAM—FURTHER HISTORY, DIAG-  
NOSIS, PROGNOSIS, AND TREATMENT.

*Sect. 2.*—The late Sir William Lawrence, Bart., appears to me, as I have already mentioned, to have been the first to have called the attention of the profession to bursal swellings of the ham. During the London Winter Session, 1837-8, he delivered a clinical lecture, at St. Bartholomew's Hospital, on "Fibrous Cysts in the Ham, containing [a thick viscid] Fluid." He commenced his lecture on this subject by stating, that "Although the disease in this case was not one of very rare occurrence, he could not refer to any surgical work for an account of its characters, nature, and treatment. It is not mentioned [he continues] in the recent valuable publication of Dr. Warren on tumours, nor in the two most modern French dictionaries."

He stated the cases he wished to direct the attention of his class to, were patients then in St. Bartholomew's Hospital, who had, in their popliteal spaces, simple *isolated* ganglions, which tumours, in their composition, and contents of their cysts, corresponded to the ganglion so frequent in the back of the hand and wrist.

Referring, for a full account, to the Lecture itself,\* I think it may be found convenient to the

\* See "London Medical Times and Gazette," vol. ii., 1837-8.



reader here to give some brief abstracts of the three cases the baronet brought before his class, at St. Bartholomew's Hospital, to support his views relative to bursal tumours of the ham.

The first case of bursal tumours of the ham adduced by the late Sir William Lawrence was the following :—

#### CASE XXIV.

George Brook, aged 28, was admitted into St. Bartholomew's Hospital, July 15, 1837. He stated that he had hitherto enjoyed good health, except that he had suffered occasionally from rheumatic pains in his left side and ankle. We are informed that the affection of his knee-joint, for which he was admitted, was at first quite chronic, but that at the end of seven weeks a change came over the patient. It appears that he then became suddenly affected by a severe exacerbation of the disease, not only in his knee, but also elsewhere.

Here, then, we have an account of two phases of development of this disease in this case, the first phase exhibiting an example of chronic rheumatic arthritis of the knee, of the usual slow form; and the second phase giving us a good illustration of rheumatic gout, attended with sub-acute symptoms, or exacerbation superadded.

Besides the swelling of the knee we learn that there existed simultaneously in the ham a tumour as large as a *middle-sized orange*, which was indolent,

painless, and near to the inner hamstring muscle, and which, under the alternate movements of flexion and extension of the limb, underwent changes, becoming remarkably tense in extending the limb, and while in the movement of flexion the popliteal tumour disappeared.

OBSERVATIONS ON SIR WILLIAM LAWRENCE'S FIRST  
CASE.

Thus, Sir William Lawrence's first case (Geo. Brook) appears to me to have been one of an exceptional form of rheumatic gout occasionally, but rarely seen. The case may have been, for the greater part of its course, quite chronic, but suddenly a paroxysm of sub-acute symptoms seem to have been superadded, but not until he had been for some time previously in hospital, labouring quite under the slow chronic affection. After the patient had been for some time in hospital—that is to say, in the second part of the course of the disease—suddenly he (Geo. Brook) was visited by sub-acute synovitis of the knee, and he suffered from *spasmodic* pains \* down the thigh; he also had pains in the loins, confining him to his bed.

For the relief of these symptoms the report of

\* Page 12, where it is stated that no one has seen much of rheumatic gout but must have noticed that there is no one symptom more complained of by the patient than the painful cramps and spasms of the muscles; and Haygarth says, "In one case the patient was attacked with severe spasmodic pains."—See case of Mr. Townsend, pages 159-160.

the case in the "Gazette" says, "The patient was cupped three times on the loins and once on the knee, and was blistered more than once on these situations; on different occasions he used the warm bath, and took the *acetous extract of colchicum* in doses of three grains at bedtime.

"He left the hospital in November, completely free from the pain in the loins and spasmodic affection of the thigh; the knee had recovered, the popliteal swelling was less, but not completely removed."

The presence of such symptoms, calling for active treatment—including also warm baths, and the exhibition of the *acetous* extract of colchicum—all this would induce us to believe that the Baronet himself must have considered he had to contend, in the treatment of this his first case, with something more than that of simple ganglion, or "fibrous cyst of the ham."

### CASE XXV.

#### SIR WILLIAM LAWRENCE'S SECOND CASE OF FIBROUS CYST OF THE HAM.

As to this second case, we are told that there was a swelling in the ham exactly similar to the preceding in size and position, and in other circumstances. The patient was between 50 and 60 years of age, and employed as private watchman, so that he had to be much on his legs, and exposed to the

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atmosphere in all weathers ; that he suffered occasionally from rheumatism. The swelling in this his second case was attended with considerable lameness.

As to this second case of Sir William Lawrence, we can look upon it in no other light than that of an ordinary one of chronic rheumatic arthritis of the knee, attended with the very usual accompaniment of distended bursa presenting itself in the ham of the affected knee. The patient, it is stated, suffered from rheumatism, *weakness*, and *stiffness* of the knee-joint—two symptoms, a reference to which we all know to form part of the voluntary history the patient gives of his case when he comes to consult us, when visited by an attack of rheumatic gout of the knee, whether attended or not by bursal swelling in the ham.

As to the treatment in this second case—that is, of the private watchman—the Baronet says:—“I directed that the swelling should be covered with the complast. ammoniacum cum hydrargyro. In ten days the swelling had disappeared, although some *weakness* and *stiffness* of the joint remained. The expectant treatment adopted in this case may be well contrasted with the antiphlogistic and depletive measures so efficiently applied in the former instance.

## CASE XXVI.

As to Sir William Lawrence's third case, he thus states:—"I had an opportunity, a few weeks ago, of ascertaining more precisely the nature of these affections. I was consulted by a lady nearly 50 years of age, on account of a soft, indolent swelling in the ham, which had existed some time, and caused little inconvenience; it was immediately under the skin, and movable in all directions. In its indolence, doughy feel, and subcutaneous situation, and complete mobility, it presented the character of an adipose tumour, and I considered it to be of that nature. There was no lameness, but the patient stated that she had sometimes experienced a little weakness in *both* knees." Sir William Lawrence represented to his patient that the swelling in the ham was merely a mass of fat; if it did not increase and did not cause any inconvenience, that it might not be interfered with, while under other circumstances it might be properly and safely removed. The patient said it was increasing, that it had caused some pain in the knee, and that she wished to have it removed if the operation could be performed safely.

*Operation.*—On dividing the integuments, Sir W. Lawrence says:—"I immediately perceived that the swelling was a *cyst containing fluid*. It was loosely connected to the surrounding parts, and thus easily detached. The mass of the swelling was immediately under the skin, but it had a *deeper*

continuation in the direction of the inner hamstring. Having traced this as far as appeared to me advisable, I cut it off, when the cyst was seen to be *fibrous, thin, and semi-transparent*, and its *internal surface* was slightly *sacculated*." So far as could be ascertained by the finger, the cyst terminated by a blind extremity, near where it had been cut through. The quantity of fluid which had been contained in it was about two or three table spoonsful. No blood was lost in the operation, which was quickly finished, and gave much less pain than the patient had expected. The edges of the wound were brought together by adhesive plaster, and rest in bed was enjoined.

"When I visited the patient the next day [says Sir William Lawrence], I was shocked at seeing her with a flushed and oppressed countenance, and a drowsy look, like that of a person in typhus. I was informed that in an hour or two after the operation, the wound and the knee had become painful, that bleeding had begun soon after, and proceeded to such an extent that a neighbouring practitioner had been sent for, who had opened the wound and applied cold, under which hæmorrhage ceased. He supposed about twenty ounces of blood had been lost. The severity of the pain induced him to administer an opiate, from which some relief was obtained. The pulse was rapid and rather feeble—the tongue was dry, with a brown middle streak, and there was that kind of restlessness, without apparent cause, which is always a most unfavourable symptom. The wound and the knee

were easy, but there seemed to be a general tumefaction of the latter. The pulse increased in rapidity and feebleness, delirium and incoherent talking came on, and the patient sank in about sixty hours after the operation had been performed, having made no complaint of the wound or knee after the first night, but, on the contrary, expressed that they were quite easy.

Sir W. Lawrence concludes the history of this his third case, by saying :—

“I cannot ascribe the unfortunate event of this case to anything connected with the peculiar affection. It rather seems to exemplify the fatality sometimes attending even *slight operations*, when performed on individuals of unsound and irritable constitutions.”

#### OBSERVATIONS ON THIS CASE.

As to the third case according to Sir William Lawrence's own opinion, it belonged to the same category that the two immediately preceding examples did ; and he added that, from the opportunity he had of examining the anatomy of the popliteal cyst while operating on, and laying bare the interior of it, he considered he was thereby enabled to attain a more complete and *precise* idea of the nature of the lesion in question in the three cases which the Baronet denominated “fibrous cysts of the ham, *containing a viscid fluid.*”

For my part, I must say that I cannot agree with this diagnosis. I do not entertain a doubt but that this third case was also one of chronic rheumatic arthritis of the knee, with the usual distended synovial bursa, protruded behind into the popliteal space, which bursal swelling was, most unfortunately, mistaken for an adipose tumour.

When we recapitulate the symptoms, we find reported by the patient herself that "she had *weakness* of both her knees; that she had pains in the joint, behind which the distended bursa was situated." These signs lead us to the suspicion that chronic rheumatic arthritis in the affected knee existed. That this was the disease which engaged one, or perhaps both, of her knee-joints, in the case of this lady, was rendered the more probable, because she, being nearly 50, had just arrived at a period of life which was known to be very obnoxious to the first advent of this disease in the female.

From the late Sir William Lawrence's clinical lecture, it might be inferred that he considered the popliteal tumours he described, and exemplified by his three cases, as isolated ganglions, new and abnormal bursæ, lesions *sui generis*, and not as swellings symptomatic of any other affection. If this were his view—which we may infer from the sentiments he has expressed and published—I must say that I feel persuaded the Baronet was mistaken in his diagnosis.

From the Baronet's own account of the external



form and exact position of the popliteal tumours, as well as the anatomical characters of the interior of one of the bursal swellings he observed during the operation of excising it, and also on account of the adhesion of the bursa to the ham-string tendon, it seems to me quite obvious that it was the normal bursa which, intervening between the tendons of the internal gemellus and the semi-membranosus, had been converted into a bursal swelling of the ham.

When we reflect on the treatment of the third case by Sir William Lawrence, we must keep present to the mind, that the Baronet made a wrong diagnosis in the case, mistaking the swelling in the ham for an adipose tumour ; and, under the influence of the error, it is by no means surprising that the treatment was unsuitable, and, of course, by no means such as Sir William Lawrence would have adopted had he made a more correct diagnosis of the case.

The operation, consisting of the attempt to completely excise the tumour, was followed by an unexpected and fatal result. In reference to this event Sir William Lawrence says he could not ascribe it to anything connected with the peculiar affection. The result, he asserts, "rather seems to exemplify the fatality sometimes attending on surgical operations, when performed on individuals of unsound and irritable constitutions."

Although the opinion here given, as to what was the cause of death in this case, may not be freely

assented to by all, nevertheless the Baronet's admission of the error he made in his diagnosis, and his candid statement and publication of the whole case, must, in my opinion, ever call for the praise and respect of the profession.

Subsequently to the publication of Sir William Lawrence's clinical lectures on "Cysts of the Ham," and to the publication of my own observations on the same subject in 1840,\* we do not find any notice taken by any writer in these islands, as to such lesions, for ten years afterwards—that is to say, until 1850. At this time, Sir Benjamin Brodie, in the fifth edition of his work on the joints, for the *first* time alluded to the subject in the following words :—

“A tumour formed by a distended bursa is of very frequent occurrence in the popliteal space. *It is probably that belonging to the tendon of the semi-membranosus muscle.* When the leg is extended, the tumour is tense and prominent, but when the leg is bent, it recedes, so as to be scarcely perceptible. In many instances it exists in combination with inflammation of the synovial membrane of the knee ; and as the cavity of the bursa, in some instances, communicates with that of the joint, the extension of the disease from one part to the other is easily explained.”

In this paragraph we find mentioned the ordinary symptoms of bursal tumours of the ham, with

\* “Lond. Cyclop. Anat. & Phys.,” vol. iii., p. 60. 1840.

which all were familiar ; but as to the anatomical characters of the lesion, we shall, I think, find the Baronet's language to have been somewhat equivocal ; for, instead of asserting *positively* that the bursal tumour usually presenting itself in the ham was the dilated bursa of the semi-membranosus, he uses the equivocal language that it was "*probably* that of the semi-membranosus." The Baronet thus would seem to have cast a doubt on a matter he had no right to do, as to the anatomical characters of the lesion, which had been previously well described and well established by dissection.\*

In pursuing further the history of bursal tumours of the popliteal space up to the present period, we find that the consideration of the subject, since 1850, has not much occupied the attention of English writers ; while, on the other hand, in France—particularly about the years 1853-6—we find many among the most eminent surgeons in Paris (apparently unaware of anything having been published elsewhere on the matter) seemed suddenly, and almost simultaneously, to take up the active consideration of bursal cysts of the ham quite as a new one. Besides Velpeau, Malgaigne, Larry, Baudoin, Chassagniac, and others, who published cases of bursal tumours of the popliteal space, we find that Foucher, prosector of anatomy of the Faculty of Medicine of Paris, produced an important memoir on the subject in the " Archives Gene-

\* *Loco cit.*, " Lond. Cyclop. Anat. & Phys.," vol. iii., p. 60.

rales de Medicine," vol. ii., p. 313, 1856, and he brought forward numerous cases of this lesion, some of which he had himself professionally attended, and others with the history of which he had been made acquainted by the published reports in the "Gazette des Hôpitaux," of cases which had been treated under the care of eminent hospital surgeons of Paris.

Foucher seems to have taken much pains in following up the anatomico-pathological history of bursal tumours of the ham, and he undertook the subject, fully persuaded, I have no doubt, that he was not anticipated in such an inquiry by any previous writer. Nevertheless, his conclusions quite corresponded with those already arrived at by others before his memoir met the public eye—namely, that the bursa of the semi-membranosus is by far the most important bursa of the popliteal region, and that it is it that we find most frequently affected by disease.

To consider carefully the observations of Foucher, and endeavour to analyse the nature of the cases of popliteal cysts he had collected together, may, perhaps, be here permitted, even though the inquiry should cause some delay, and draw us for a moment away from the subject we had specially placed before us—namely, to discuss the subject of bursal cysts of the ham, with reference particularly to those which were symptomatic of rheumatic gout of the knee. Nevertheless, as I feel persuaded that some of the cases detailed by Foucher were not really, as supposed to be, accidental cysts of the

ham, but bursal tumours symptomatic of other affections, under this impression, I have considered that I might feel justified in dwelling a little longer on Foucher's memoir, and in laying before the reader, for his judgment as to this matter, the two following cases :—

The first case of Foucher's I would allude to is entitled, *Hydarthrosis of both Knee-joints — Double Popliteal Cysts.*

#### CASE XXVI.

“ In June, 1852, a man, aged 34, the conducteur of an omnibus, entered the Hospital St. Antoine, under the care of Mons. Chassagniac, on account of having both his knee-joints in a state of hydarthrosis for four or five years. Besides the ordinary symptoms of synovial swelling in front of the knee, this man had also, in each popliteal space, a fluctuating tumour, which pressure rendered flaccid and soft, yet it was not possible to reduce completely the popliteal swelling. On compressing the knee in front, we rendered the tumours in the ham hard, tense, and shining. The neck or pedicle of each popliteal tumour was deep, and could be felt placed to the inner side of the popliteal vessels and nerves. The tumour which occupied the ham at the right side was larger than the other, and, when pressure was exercised on it, one could make the liquid flow from the cyst into the synovial sac of the articulation, and could perceive a ‘fremisse-

ment' became very evident. The patient only remained two days in hospital, and was subjected to no treatment."\*

## OBSERVATIONS ON THE CASE.

In the succinct history given and published in Foucher's memoir of Mons. Chassagniac's case, no mention is made as to any of the general signs of rheumatic gout having been noticed to have existed in any of the other articulations of the patient; still, as the swelling of *both* the *knee-joints* was said to have been of four or five years' duration—that is to say, that a chronic arthritis had long existed—and as, moreover, that remarkable feature of rheumatic gout consisting in a symmetrical affection of the corresponding articulations of opposite sides was noticed in this case—under such circumstances, I think we may be permitted to suggest the probability of this case, adduced by Foucher, as one of his "Kystes de la Region Poplitée," being a well-marked specimen of rheumatic gout—indeed, exactly such a case, so far as both knee-joints were concerned, as the case of P. Donohoe, delineated in the "Atlas" of this work, Plate ix., and frequently referred to—see Index.

While Foucher's foregoing case must be looked upon as belonging to the category of cases of hydarthrosis, with distended bursæ of the semi-membranosis, symptomatic of chronic rheumatic arthri-

\* "Gazette des Hôpitaux," 1854, p. 474.

tis, the following case, by the same author, appears to be a sufficiently well-marked example of hydarthrosis of the knee, with bursal tumour also in the ham ; but, in this last case, we have no evidence of the case being one of Foucher's simple popliteal cysts, nor of one of rheumatic gout, but the case appears to exhibit well marked signs of the patient having been affected with constitutional syphilis.

### CASE XXVII.

BURSAL TUMOUR OF THE HAM, WITH HYDARTHROSIS OF THE KNEE—SYMPTOMATIC OF CONSTITUTIONAL SYPHILIS.

“ Petit Jeanne, æt. 43, of no profession, was admitted into La Charité on the 15th July, 1852. This woman was apparently robust, and of a sound constitution, and complained only of rheumatical pains in some of her joints, and particularly in her left knee. About a year before her admission into hospital, she one day observed her left ham to be somewhat swollen, but complained of no pain in it. She, however, subsequently noticed the tumour in the ham gradually to increase in size ; and on this account it was that she then sought admission into La Charité. When she presented herself at the institution, besides an hydarthrosis of the knee, visible in front, there was a *bursal tumour in the ham*, attended with the ordinary symptoms of the lesion, viz., disappearance of the tumour on flexion of the knee, and on the contrary tension and prominency of it when the limb was extended.

“ This woman, besides the local swellings of the left knee and tumour in the ham, had also *condylomata* about the anus, which evidently denoted that she was constitutionally affected with syphilis.”\*

OBSERVATIONS ON THE CASE.

Here, then, is a case of a bursal tumour of the ham, with hydarthrosis of the synovial membrane of the knee—these swellings being evidently symptomatic of constitutional syphilis. We have also to remark that condylomata, mentioned as well as the rheumatical pains, yielded to an anti-syphilitic treatment. This case, therefore, is one which we presume should not be classed with bursal cysts of the ham, such as Foucher's memoir contemplated.

We should not, perhaps, conclude our review of M. Foucher's memoir on popliteal cysts, without observing that, although seemingly quite unacquainted with anything on the subject, except what he had learned from French literature, Foucher seems of himself to have come to the same conclusion which had been arrived at previously by others—namely, as to the fact of the frequency with which the bursa of the semi-membranosus has been found to be the seat of bursal tumours of the ham, as well as to the importance of the part which this bursa plays in the pathology of the popliteal region, an importance, Foucher considers, that he was himself the first to signalise.

\* Foucher's Memoir, *loco cit.*, p. 303.



BURSAL TUMOURS DEVELOPED IN THE VICINITY OF  
THE JOINTS—THEIR CAUSES, TREATMENT, ETC.,  
ETC.

*Sect. 3.*—I have already stated my belief that bursal tumours, presenting themselves in the immediate vicinity of the joints, will generally be found to be the normal bursæ of the region excited into inflammatory action, which had extended to them from some of the articular textures of a neighbouring joint. These bursal tumours, we learn, sometimes arise spontaneously, sometimes they owe their origin to sprains, contusions, or other local injuries, directly inducing inflammation of these structures; and sometimes they make their appearance as the result of constitutional causes, such as secondary syphilis; sometimes they appear to be the consequence of the abuse of mercury; sometimes of an attack of gout, or of ordinary rheumatism; but more frequently do they seem to be the result of rheumatic gout, or chronic rheumatic arthritis, than of any other cause or affection whatsoever.

TREATMENT OF BURSAL TUMOURS DEVELOPED IN  
THE IMMEDIATE VICINITY OF THE JOINTS.

The medical and surgical treatment of these lesions should be conducted on the same principle as the treatment of inflammation of the synovial membrane of the joints. The inflammation, for the most part, will be found to be a synovitis of the lining mem-

brane of the bursal swellings, which may be either acute or chronic, and each form should be treated accordingly. Acute inflammation of a bursa, resulting in the formation of a swelling of the sac, painfully distended with fluid, may be treated by active antiphlogistic measures, while the part affected is kept in a state of rest. Under such treatment, speedy and happy results follow.

On the other hand, when inflammation has been for some time established, we shall frequently find a bursa distended with fluid still remaining after the inflammation which had originated it had apparently subsided. Under these last circumstances, we shall find (if called to treat such a case), that we have a chronic condition of things to contend with, demanding much patience, not only on the part of the sufferer but on that of the medical attendant also. After the inflammation has apparently subsided, and that the bursa still remains in a passive state, the application of a blister will be found necessary; and the surface of the skin must be kept raw for a time by the application of *such counter-irritants* as savine ointment, &c., &c. This treatment will be frequently attended with good results; but we should add that the course of these cases may be expected to be always tedious, and, as Sir Benjamin Brodie has well observed, "to occupy the period of many months."

*Discussant* applications also may be had recourse to, such for example as solutions of acetate of lead in distilled water with some spirits of wine added; or

we may use with advantage such applications as were strongly recommended by Baron Boyer in the treatment of bursal tumours, which solutions were composed of muriate of ammonia in water, in the proportion of an ounce of the former to a pint of the latter.

When bursal tumours, or ganglions, have become quite chronic, and have hitherto resisted all that may be called *medical* treatment, and the patient seeks to be relieved of the deformity, or of the disease, then surgical treatment must be resorted to.

And as to what should be the surgical treatment appears to be a matter by no means settled. We are informed, on excellent authority, that "the common affection called ganglion, simple as it may appear, and in general is supposed to be, is still a subject on which a very considerable difference of opinion exists among surgeons."\*

Ganglion situated on the dorsum of the wrist and carpus constitutes the most frequent example we meet with of this disease; and the usual treatment of the ganglion in this locality is the *subcutaneous bursting* of the bursal tumour.

Sir Astley Cooper, for example, in his lectures, was in the habit of saying, "Ganglions of the back of the carpus are sometimes mistaken for dislocation of one of the carpal bones, but in such cases, the smart blow of a book will disperse the swelling, and dispel the cloud of doubt on the subject."

\* The Editor of the "British Medical Journal," July 1st, 1871, p. 9.

This last is a very old and popular method of treating ganglion developed on the dorsum of the carpus; and although it must, I believe, be admitted that this operation, the simple bursting of the ganglion, frequently fails in effecting a cure, yet it may be truly said, with reference to the practice, that it is never followed by any injurious effects. For my part, I am very much disposed to think, that if subsequently to the operation of bursting the ganglion above alluded to, be joined that of the methodical application of pressure on the back of the wrist for a time, and that the motion of the wrist be prevented, a complete cure of the ganglion may very generally be effected in one fortnight.

To test the value of this mode of treating the simple ganglion on the dorsum of the carpus, I treated recently, under the observation of the clinical class in the Richmond Hospital, the following case:—

### CASE XXVIII.

CASE OF SIMPLE GANGLION ON THE BACK OF THE HAND AND WRIST—SUBCUTANEOUS BURSTING OF THE TUMOUR, FOLLOWED BY THE USE OF A SPLINT AND COMPRESSION—RECOVERY.

Anne Hanly, æt. 14, residing at Bishop's-court, county of Kildare, was admitted into No. 9 ward, Richmond Hospital, under the care of Mr. Adams,

on the 16th of October, 1871. She had a small ganglion about the size of half a walnut situated on the back of her left wrist of an oval form, and somewhat movable, painless, fluctuation distinct, the integuments freely movable over the tumour. She stated the little tumour was of two years' standing, and ascribed it (with apparent truth) to a smart blow she had received with a ruler from her school-mistress. The only treatment this ganglion was subjected to, before her application to the hospital, was the painting of the little tumour with the tincture of iodine.

Mr. Adams placed the girl's forearm on a study table, drawing forcibly the patient's hand over its rounded margin, and stretching the wrist, making the posterior wall of the ganglion tense. While Mr. A. drew upon the hand in this position, Mr. Vesey gave a smart blow to the back of the ganglion with a book. The tumour became instantaneously diffused in the surrounding reticular tissue. A compress was now applied over the exact spot the ganglion had occupied, and it was retained there by a strip of soap plaster spread on elastic calico an inch broad, which was strapped round the place the ganglion had occupied. The back of the wrist, the hand, and forearm were placed on Bartin's American splint; and in the former case the immobility of the wrist was secured by the having placed on the back of the wrist and forearm a paste-board splint, and a roller was applied *over* all. October 26th, we learned that the patient suffered no

pain, heat, nor swelling, nor any inconvenience whatsoever, during the days following the operation described. The dressing and compression were removed and renewed every second day; and when the dorsum of the carpus was examined on the fourteenth day after the subcutaneous bursting of the ganglion, viz., on the 30th of October, the *note* taken down by Mr. Vesey is as follows:—

“No appearance of any tumour whatsoever is now to be seen on the dorsum of the wrist in the case of A. Hanly. All compresses and splints and bandages were removed. It was directed that douches of hot and cold water should be alternately applied to the back of the carpus.

It is now more than two months since the above mentioned treatment had been commenced, and she has been using, in the country, her hand and arm freely; and, on inquiry, Mr. Vesey received a letter from her father lately stating that the girl had perfect use of her hand, and that nothing whatever could be seen in the original seat of the ganglion.

This simple mode of treating this form of ganglion should, I think, be preferred and tried before any severer surgical operation by puncture or subcutaneous incision should be resorted to.

It is not on the dorsum of the wrist only that we may see specimens of the simple sub-cutaneous ganglion, for I may here observe that I have, for many years, been in the habit of noticing small bursal tumours, about the size of a hazel nut, situated low down in front of the radius, just where

we ordinarily feel for the radial pulse. This little tumour is usually intimately connected with the radial artery, and may have a pulsation communicated to it, so that the bursal swelling may again be, as it has been, mistaken for an aneurism.

The patient may feel inconvenience from a ganglion situated in this locality, from the circumstance of the little tumour projecting beyond the anterior surface of the wrist, for thus it may become an obstacle to the use of the wrist in the case of a laundress, particularly if it be the left forearm which is affected; under other circumstances, the presence of the ganglion is but little complained of.

I have, for many years, observed this lesion in persons of all ranks—more frequently in females than in males. In some of the cases I have been consulted relative to it, no cause could be assigned by the patient for its origin. In one case, that of a celebrated orator who was accustomed to accompany the delivery of his orations with much over-action of his right arm, he attributed the origin of the little subcutaneous tumour in front of the wrist, to this over-action of the arm.

In some cases I have seen in private life, this little tumour would appear, and then, after a time, would disappear, and ultimately subside altogether; but, in my observation, this has rarely been the case in working-people, such as housemaids and laundresses.

The species of sub-cutaneous bursal tumours, or ganglions, situated low down in the front of the

wrist, we are here considering, is not a very uncommon lesion, and must have been frequently noticed by practitioners. It is strange, however, that such tumours, in this situation, have been but sparingly reverted to, by writers on bursal tumours.

Chassaignac has lately brought forward the notice of this lesion, but has claimed for himself, too hastily,\* the merit of having been the *first* to call the attention of the profession to this form of sub-cutaneous bursal tumour in front of the wrist, and which he denominated the *sub-arterial* hygroma of the wrist. He states that he has been able to demonstrate the existence of this variety of bursal tumour, situated on the front of the wrist, not only by his clinical observations, but also by his dissections.

He informs us that, on the 9th of April, 1845, he presented to the Surgical Society of Paris a preparation, which exhibited a tumour about the size and form of a large almond, which occupied the small space in front of the lowest part of the radius, between the tendon of the supinator longus and that of the flexor carpi radialis. The tumour reposed by its deeper surface on a small portion of the anterior and lower fibres of the pronator quadratus muscle. In this pathological preparation, the radial artery was seen, in its descending course, to have placed itself in front of the little tumour, with which it seemed to have become intimately connected.

\* "Dictionnaire Encyclopedique des Sciences Medicales,"  
tome x. 1869. Paris.



The radial artery then turned off obliquely, to pass under the extensors of the thumb. The continuity of the cyst with the interior of the articulation of the wrist [says Chassaignac] was rigorously demonstrated.\*

As to treatment, Chassaignac says that this variety of hygroma he has constantly succeeded in curing, by making his patient apply to the ganglion frictions of the iodide of potassium ointment every two hours. He considered any other treatment to be unsuitable, observing that while the presence of the artery in front of the tumour contra-indicated the subcutaneous bursting of the ganglion, the circumstance being known of the communication of the interior of the ganglion with the joint having been stated to be a usual occurrence, was opposed to all injection of any irritating fluid into the cyst of the tumour, as a means of cure. Chassaignac concludes by stating that the practice of applying to the little tumour the iodide of potassium ointment, every two hours, exposes the patient to no accident, and possesses all the efficacy which can be desired—an opinion with which we cannot concur.

In giving the history of this form of subcutaneous ganglion, situated low down in front of the wrist, I have mentioned that I did not consider that Chassaignac could justly claim for himself the merit of having been the first to call the attention of the profession to this special lesion, because

\* "Gazette des Hôpitaux," 29 Avril, 1845.

I find that, above half a century ago, in the 17th volume of the "Edinburgh Medical and Surgical Journal," June, 1821, there has been published a case of this very form of ganglion in front of the wrist, by John Burne, Jun., Esq., nearly as follows :

### CASE XXX.

MR. BURNE'S CASE OF SUBCUTANEOUS GANGLION, SITUATED  
IN FRONT OF THE WRIST—MISTAKEN FOR AN ANEURISM.

A young lady residing at Ardres, in the north of France, requested Mr. Burne's opinion concerning a tumour which had been forming at the wrist for a considerable time. The figure of the tumour was somewhat oval, the situation *exactly in the course of the radial* artery, being in front of the base of the radius. It entirely disappeared on the application of firm pressure, and, on the removal of it, reassumed its former size. The situation, the general pulsation, and, above all, the disappearance of the tumour on pressure, decided Mr. Burne at once to pronounce it an aneurism, and to advise the lady to submit to the operation as the only means of cure. Several surgeons of Calais, Ardres, and St. Omer had been consulted. They all gave a similar opinion. The lady, anxious to get rid of the swelling, although neither painful nor troublesome, consented to the plan recommended. Happily, however, both for the patient and for myself [says Mr. Burne], her friends were opposed to it, and the operation was, in consequence, delayed. Mr. Burne

left Ardres and lost sight of the patient for seven months, but at the end of this time, having returned, he again saw the tumour. It was rather enlarged—in other respects it was unaltered.

Upon closely examining the tumour, Mr. Burne could now trace the course of the radial artery, and that of the *superficus volæ* branch, and, moreover, the swelling now appeared to him to have assumed the appearance of a ganglion, and he thought it possible that it was formed in the theca of the tendon of the *flexor longus pollicis*, on which the radial artery lies. The gradual enlargement of the ganglion seemed to have raised the artery from its natural situation; the course of both the trunk of this artery and its branch (the *superficus volæ*) was plainly seen; and thus Mr. Burne became sensible of the error he and his confrères had at first fallen into. M. Ballard, an eminent surgeon of St. Omer, who had also been previously consulted, entirely concurred in Mr. Burne's reconsidered view of the case.\*

While much interested in the consideration of these subcutaneous ganglions situated in the front and lower part of the wrist, and which are remarkable for being closely connected with the course of the radial artery, two patients from different quar-

\* The record of this interesting case had not, until very lately, met my eye, and was shown to me by Mr. Vesey. Among French writers, I find it mentioned by Surgeon V. A. L. Legouest, in his "Thèse présentée et soutenue à la Faculté de Médecine," p. 53, 1857.

ters, Eliza Moat and Mary Murray, both applied to us on the same day, viz., the 16th of January, 1872, each presenting us with an example of one of these little sub-cutaneous ganglions of the front of the wrist.

### CASE XXXI.

The first of these, Eliza Moat, æt. 40, I at once admitted into the Richmond Hospital, under my care, in No. 8 Ward. The patient stated she knew no cause for the origin of the little tumour, which



FIG. 42.

Sub-cutaneous Bursal Tumour in front of the Wrist.

she first noticed seven months previously. She observed that it gradually became larger, until it attained the size of a hazel-nut. (See woodcut, Fig. 42.) She stated that the prominency the little tu-

mour formed in front of the left wrist caused her the greatest inconvenience when working as a laundress, because, when she used with much force her right arm and hand in washing, the counter-pressure she habitually opposed to this force by her left wrist caused the skin covering the ganglion to become excoriated, and, in a few days, she was thus compelled to desist from her labour, and to give up the only means she had of maintaining herself. She informed us that she sought for advice elsewhere as to how she might be relieved from this distressing state of things, and had been treated for the lesion by various means, and among them we may mention that the subcutaneous bursting of the little tumour had been twice resorted to ; but the simple operation (not followed by any other treatment) signally failed on both occasions, and the woman, somewhat discouraged, submitted herself at once to our treatment in the Richmond Hospital, anxious to be cured of what, she said, might appear to others, at first view, a trifle, but a state of things in her case, she believed, existed, which might, if not remedied, soon incapacitate her from earning her bread.

15th January.—The subcutaneous bursting of the tumour was effected to-day, and the compresses, splints, and bandages, were applied. They were taken off and replaced every alternate day for fourteen days, when, on the 1st of this month, February, it was considered no longer necessary to make use of any further appliance to the wrist.

6th February.—Eliza Moat left the hospital to-day quite well, having no appearance whatever of any bursal tumour.

### CASE XXXII.

As to the remaining case of subcutaneous bursal tumour in front of the wrist, I shall only add a few words. The patient, Mary Murray, *æt.* 44, housemaid, healthy, complaining only of pains in her right shoulder, influenced much by the state of the weather, has a small bursal tumour, close to the course of the radial artery, just where the vessel turns round the radius to get under the extensor tendons of the thumb. The size and form of the little tumour may be well represented by the woodcut (Fig. 42) of the case of Eliza Moat. It is to be remarked, however, that in this last case (M. Murray), it was her right wrist was the seat of the lesion. She stated that she had observed this little tumour for many years, and knew no cause for its origin; that when it first made its appearance it did not remain permanently in the situation specified; that it would sometimes disappear for a time, and then return; but that, for the last ten years, it has remained permanently in the same position, undergoing no change, causing her no inconvenience. The artery can be felt pulsating behind the little tumour, but this last cannot, by any pressure, be made to disappear, or retire, as it were, into the joint. There does not, therefore, appear to be any communication between

the interior of this little tumour and the articulation of the wrist; but a close examination would lead us to say that the little tumour was pediculated, and that the pedicle could be traced towards the wrist-joint itself, which articulation is perfectly sound, and does not partake of the pains her shoulder of same side is affected with.

The circumstance of the little bursal tumour being situated in front of her *right* wrist, instead of her left, as it was in the preceding case, made a great difference in her favour, as the skin of her left wrist being unaffected by any tumour, she can use her hands in washing without any inconvenience. This woman's case, so far as the bursal tumour is concerned, demanded no treatment; but it appears to me to possess some interest as a well-marked example of the subcutaneous bursa in front of the wrist, and, on this account, worth this passing notice.

THE TREATMENT OF GANGLIONS ON THE DORSUM OF  
THE CARPUS—PUNCTURES, INCISIONS, EXCISIONS—  
SETONS.

So far as I have hitherto pursued the subject of the consideration of bursal tumours, in the immediate vicinity of the joints, I have adverted to a treatment of them which consists in acting on the external surface of the bursal tumour only, without at all penetrating the skin, or producing the effect of making a communication between the interior of

the affected synovial cyst and the atmosphere ; but presently I shall have to revert to the consideration of the treatment of bursal tumours and ganglions, by operations by no means free from danger, such as punctures, incision, excision, and setons—operations which have been from time to time recommended and practised with varied results.

As to the treatment of the simple ganglion, so commonly seen on the dorsum of the carpus and wrist, and in which the more ordinary and simple means of treatment had failed, in such a case I would not hesitate to treat the case by traversing the ganglion through and through by means of a curved surgical needle, and by the forcible pressure of both my thumbs pressing out completely the glairy contents of the ganglion.

### CASE XXXIII.

#### TREATMENT BY PUNCTURES, AND SUBSEQUENT COMPRESSION.

I was (in 1865) consulted on the case of a Miss T., æt. 19, living in Leeson-street, Dublin, who had one of these ganglions on the back of her hand, about the size of half of a large walnut. The origin of the swelling she attributed to over-exercise of her hand in playing on her piano. The small tumour gave her no pain whatsoever, but the deformity having failed to give way to rest, to slow compression, or to evaporating lotions, I was applied to, to recommend some more effectual means to be had recourse to.



The simple treatment, as above mentioned, consisting in—(1) The perforation through and through of the ganglion by the curved needle ; (2ndly) The complete evacuation of the bursal cyst by the forcible pressure of the thumbs made on the back of the carpal tumour ; and (3rdly) The continued compression on the walls of the evacuated ganglion for a fortnight, were effectual in effacing all appearance of bursal tumour.

I may mention that my neighbour, Dr. Owens, of Kildare-street, being in consultation with me, not long ago, on another case in Mr. T.'s family, we took the opportunity of examining the wrist of this young lady, and that it, we found, had remained perfectly well ever since the splints and bandages were removed—a period of seven years.

The mode of treatment of simple ganglions situated on the back of the hand, by *punctures* and the evacuation of their contents, I have had frequently recourse to, with success ; but it must be confessed that in some cases more inflammation than is desirable may follow the operation ; and that we may not be unprepared for such an occurrence in exceptional cases, it may not be amiss to detail the history of one of such cases lately under observation at the Richmond Hospital.

## CASE XXXIV.

OF GANGLION ON THE BACK OF THE HAND—FAILURE OF THE OPERATION OF THE SIMPLE SUB-CUTANEOUS BURSTING OF IT TO EFFECT A CURE—SUBSEQUENT TREATMENT, BY TRAVERSING THE CYST WITH A SURGICAL NEEDLE—EVACUATION OF THE CONTENTS THROUGH THE TWO OPENINGS MADE BY THE NEEDLE—INFLAMMATION AND SUPPURATION FOLLOWED THE PUNCTURES—THE RECOVERY TEDIOUS, BUT PERFECT.

Elizabeth Mulligan, æt. 18, was admitted on the 24th August, 1871, into the Richmond Hospital, under the care of Dr. Adams, to be treated for a ganglion on the back of her right hand. The walls of the cyst (felt through the skin) seemed rather thick. The patient's fingers were stiff, and it gave her some pain to flex them. The ganglion was a little tender when compressed. The patient was a delicate-looking young person, and we were informed by her father that she was liable to fainting fits, and her aspect manifestly showed that she was of an hysterical constitution. She stated that she could assign no cause for the origin of the ganglion, with which she had been affected for the last four years.

About five months ago, i. e. March last, she applied to Mr. Vesey, at the Richmond Hospital, our senior resident pupil. He, in the ordinary manner, by means of a smart blow with a book, dispersed the contents of the bursal tumour into the surrounding reticular tissue on the back of the hand and wrist, and he placed the splint and compressed the

bandage, as in the case of the girl just now recorded (A. Hanly), but all in vain; for the patient would not submit herself to the necessary inconvenience of wearing splints or to the use of compress and bandages; and when she appeared again at the Hospital, in five months after the ganglion had been burst, the bursal tumour then appeared enlarged fully as much as before.

On the 19th of August Dr. Adams passed a curved surgical needle entirely through the ganglion in this case, and, by very firm pressure of both his thumbs, he completely expelled all the glairy fluid the ganglion had contained. Compresses, splints, and bandages were applied, exactly as in the case of A. Hanly.\*

20th August, next day after the operation, we find noted that "The patient was feverish, her pulse 120, that she had passed a sleepless night, that she would not keep on the splints, compress, or bandage; some redness and swelling of the back of the hand observable."

24th August (6th day after the operation), "The patient had a rigor; the local inflammation and pain much alleviated by the effects following the application of six leeches."

31st August, "The back of the hand more swollen, fluctuation of matter perceptible in the site of the former bursal tumour; Dr. Adams made an incision into the little abscess now formed on the

\* See p. 479.

back of the hand, and exit was thus given to pus and serum with much relief to the patient."

From this period she daily improved, as to the state of her wrist, for three weeks, when she was attacked with erysipelas, which made its appearance on the integuments of the shoulder of the same side as that of the affected wrist. This, however, soon subsided, so that our report relative to the effects of the operative proceedings on the ganglion may here cease; and in conclusion, we have only to remark, that although the recovery of this delicate girl was tedious, still the ultimate report of her case, when, at our request, she appeared at our Hospital on the 23rd of December for inspection, was, "No trace of the ganglion is to be seen. The cicatrix left after the healing of the incision, made to evacuate the abscess is a trivial mark. The power of fully flexing and extending the fingers is perfect."

In conclusion, I may here remark that it might have been more prudent, before the patient had been subjected to any surgical operation, to have taken care that her general health should have been in a more satisfactory condition; but the girl, now aged 18, just commencing an important era of her life, and weary of having suffered from the ganglion for four years, did not appear to us, at the second period of her application to the Hospital, at all likely to listen to any proposition for delay as to the further treatment of her case.

## SUBCUTANEOUS PUNCTURES FOLLOWED BY COMPRESSION.

A surgeon of Glasgow made some observations on the treatment of ganglion, in the "Edinburgh Medical and Surgical Journal," vol. xxiv., 1825. He observes truly that the walls of the ganglion are sometimes too thick to give way to the operation of bursting the tumour, and expresses his opinion as to the best mode of treatment of the simple ganglion on the dorsum of the carpus, in the following words:—

"It occurred to me that, by introducing a cataract needle obliquely through the skin, freely dividing the sac, and then pressing the contents into the cellular tissue, I should succeed effectually in removing this disease, without giving the patient any pain, or running any risk of inducing inflammation of the cavity."

Dr. Cumin adduces the following case:—

## CASE XXXV.

Christian Liddel, admitted into the Lock Hospital, Glasgow, November 15th, 1824.

"The skin over the ganglion was to-day drawn firmly to one side, and a couching needle introduced into the tumour. The sac was freely divided, and the contents passed into the surrounding cellular tissue. A small portion escaped through the external puncture, and presented exactly the ap-

pearance of the white of egg.—Compresses and bandage, solution of acetate of lead.

“December 2nd.—Fluid is again collecting in the ganglion.

“December 20th.—The ganglion, which was much smaller than on the former occasion, was to-day emptied, as before, by means of the couching needle and direct pressure. After this the fluid was daily pressed out of the sac into the surrounding cellular tissue, until the 24th. On this day but a small quantity was found in it; and, as the woman was considered cured, she was dismissed, with directions to repeat the pressure daily for some time.”

Dr. Cumin concludes by stating that he had an opportunity of seeing this patient at the hospital on the 21st of February, 1825, and he added, “I could then detect no trace of the ganglion, except a slight thickening in the situation which it had occupied.”

L. M. Michon,\* in alluding to Dr. Cumin's right of priority as to the pointing out the method of treatment, says the operation he has recommended has the advantage of causing but little pain to the patient, and it does not expose the interior of the cyst of the ganglion to the influence of the external air. The punctures are made on the border of the tumour whereby the subsequent compression is not interfered with.

\* “Thèse,” Paris, p. 208.

M. Michon says the method of Dr. Cumin is open to the objection that in general it does not excite a sufficient degree of inflammation of the tumour—an objection, however, which can be replied to\* by the operator employing the couching needle with a little more freedom on the interior surface of the walls of the cyst.

After considering the method of treating ganglions by the subcutaneous puncturing of them, we naturally next pass to that of the subcutaneous incision of them. Michon informs us that, in 1838, M. Barthélemy proposed the plan of treating these little tumours by a subcutaneous incision. He recommended that a fold of the skin over the ganglion be pinched up, and drawn towards the lower part of the circumference of the tumour, and that a small instrument terminating in a point of steel, of a lance shape, shall be plunged into the skin, previously pinched up at a little distance from the circumference of the ganglion. The sharp, lance-shaped instrument should now be passed underneath the tumour, and its cutting edge turned upwards; the instrument is then to be withdrawn, traversing backwards the cyst of the ganglion in the opposite direction to which it had entered, and dividing, as it passes into two lateral halves, the ganglion. This is the mode recommended by Barthélemy.†

\* L. M. Michon, These, Paris, 1854.

† Gazette des Hopitaux, 1838.

Mr. Marshall, we are told, has adopted nearly the same mode of procedure. He takes an instrument with two cutting edges, introducing it under the skin, as M. Barthélemy does, and transfixes the ganglion.

He is of opinion that the cyst of the ganglion should be divided, not from below upwards, but horizontally, so as to leave one half of the cyst above, and the other beneath. In making the horizontal incision, no doubt there will not be any danger of wounding the under surface of the skin above the ganglion, nor, on the other hand, of interfering with the fibrous structures beneath it, to which structures the cyst of the ganglion is usually adherent; M. Malgaigne, who is a great advocate for the subcutaneous *incision* of the ganglion, and whose mode of operating has been much followed in France, severs the cyst of the ganglion into four parts, and at the same time somewhat roughly treats the interior of the cyst, with a view to excite a sufficient degree of adhesive inflammation in the interior of it.\*

These simple modes of treatment have been found efficacious in such cases as the simple ganglion, situated on the dorsum of the carpus and wrist, yet we must bear in mind that, in addition to the many measures we have indicated, authors make mention of others, such as *Incision*, *Excision*, *Extirpation*, and *Cauterization*,

\* See "Manuel de Médecine Opératoire," p. 113, par J. F. Malgaigne, Paris, 1837.



and therefore, perhaps, it may be right here to consider the nature of such measures, and as to their suitability for the treatment of the simple ganglion in question. As to the free *incision* of the ganglion, this has been sometimes recommended, and seems to be occasionally practised. My colleague, Mr. John Hamilton,\* says, "that in some cases he prefers to open the ganglion freely, and insert a piece of lint into the cavity;" this, he adds, "excites inflammation and suppuration, and effects a radical cure." Yet, independently of the deformity of the cicatrix which must remain after the incision, to me it appears very questionable how far so painful and severe a measure of treatment is justifiable in the case of the simple ganglion we are familiar with, as that situated on the back of the wrist and carpus. As to excision and extirpation, I agree with Velpeau in considering that these operations, for the cure of ganglion, can never in the true sense of the words be complete, because, in reality, we can remove a *portion* of the cyst only; hence the so-called operation of Excision and Extirpation must prove to be merely an incision little more extensive than the ordinary simple incision is. As to *Cauterization*, the great advocate for this measure, M. Paysan,† reports that the removal of a ganglion may be safely and efficiently done by means of caustic, and he adds that any probability of an unseemly

\* "British Medical Journal," July 29th, 1871.

† "Bulletin Therapeutique," T. clxxiv., p. 48.

cicatrix resulting from the removal of the ganglion by this means is completely obviated by the use, as a caustic, of the "Pate de Vienne," which is applied over the ganglion in the form of a thin layer. He adds, that at the end of some days an Eschar is detached, the ganglion is emptied, and its cyst exfoliates without the occurrence of any accident to interrupt the cure.

Although M. Paysan promises that his mode of proceeding in removing ganglions is so far satisfactory that the healing of the wound after his operation of cauterization is not followed by the formation of an unseemly cicatrix, and that he, moreover, so asserts that his mode is free from risk to the patient; still to me it appears that, from his own account of his cauterization, we can infer that it must of necessity be followed by much inflammation of the cyst of the ganglion, as well as of the fibrous tissue on the back of the wrist, which constitutes a portion of the capsular ligament of the joint, to which fibrous structure the cyst of the ganglion is always, I believe, adherent.

Besides the terms M. Paysan uses in describing the effects of his operations, such as the "detachment" of an "eschar," and the "exfoliation" of the cyst, intimate to us that M. Paysan must have observed that no small degree of the inflammation of the cyst of the ganglion must have been the necessary result of his treatment, and such inflammation in the vicinity of the wrist joint cannot, I repeat it, be unattended with danger to

the articulation. This consideration alone, independently of other objections, renders the cauterization plan of M. Paysan quite undesirable. For my part, in conclusion I will say, that I am convinced that in the greatest number of cases the cure of a ganglion, of the species we have been considering, can be obtained without any necessity arising for our having recourse to these extreme measures.

When we reflect upon all the means which we have at our disposal, and which have already been found to have been efficacious in many cases, and dangerous in none, under such circumstances need we ask ourselves whether there can be any necessity to have recourse to the extreme measures spoken of by some authors? We would sum up the doctrine we have advocated in the preceding pages, as to the treatment of the simple ganglion on the dorsum of the carpus and wrist, by saying :—

That we should first try the effects of discutient lotions and ointments ; if these fail, we should next have recourse to the subcutaneous bursting of the cyst of the ganglion—this operation to be followed immediately by the application of splints, compress, and bandage ; these applications to be continued for a fortnight. Next, we have recourse (if necessary) to the subcutaneous puncturing of the cyst of the ganglion, and next to the subcutaneous incision recommended by Barthélemy, or the multiple subcutaneous incision of Malgaigne, and these might require ultimately to be supplemented, perhaps, by the

application of tincture of iodine, or some other form of counter-irritation, if any swelling remain. But I repeat it, that having at our disposal so many means we have hitherto found to be efficacious in treating the simple bursal tumour of the back of the carpus, we should not contemplate for one moment such extreme measures as extirpation or cauterization.

TREATMENT OF SYNOVIAL SWELLINGS OF THE BURSAE  
OF THE TENDONS OF THE FLEXOR MUSCLES OF  
THE FINGERS.

This species of bursal swelling above referred to, commences by the setting in of some inflammatory action of the lining membrane of the bursæ, which envelopes the tendons of the flexor muscles of the fingers, as these tendons pass beneath the annular ligament of the wrist. This inflammatory action, whether acute or chronic, is soon succeeded by the effusion into the bursæ of an inordinate quantity of synovial fluid. At first the effusion is small, and the bursal sac keeps within its normal boundary, behind the annular ligament; but the fluid gradually accumulating, the swelling descends on one part, into the *palm of the hand*, and on the other ascends, and appears in the fore-arm, immediately above the annular ligament. Thus the whole oblong bursal tumour, constricted, as it is, in the situation of the annular ligament of the wrist, when viewed externally, would appear to be

double.\* Nevertheless, by a careful manipulation, the cavity of the swelling above the annular ligament will be found to communicate freely behind it with the interior of the swelling which occupies the palm. Making pressure (above the level of the annular ligament) of the swelling, its contents, consisting of synovial fluid with the foreign bodies floating in it, pass from the part of the cyst above into that below. This passing of its contents from one part of the bursal swelling into the other is always marked by "*a frottement*."† This is thought by some to arise from the rubbing against each other, *in transitu*, of the small corpuscles these bursæ contain; and by others the "*frottement*" is attributed to the friction of the small corpuscles against the edges of the ring or opening of communication existing between the palmar and anti-brachial portion of the bursal cyst.

The patient generally suffers little or no pain, but complains of a numbness and weakness in the fingers and wrist. In these cases the skin remains in its normal state, the fingers become somewhat fixed. There is some difficulty experienced in fully extending them. When this bursal tumour is small it may be looked upon as a simple object of deformity only; but whenever it attains a considerable size, it then becomes very inconvenient to the patient, and prevents him from moving the fingers. In

\* Fig. 41, p. 448.

† A peculiarity of sound and movement, the combination of which has been denominated a "*frottement*."

this case it is, says Boyer, "a disease to be thought of the more seriously, because the kind of operation often proposed as a cure for it is not always, in its consequences, free from accidents, and may even cause death."

If we investigate the history of this form of bursal tumour, constituted by an effusion of synovial fluid into the bursæ of the tendons of the flexor muscles of the fingers, we find that this is a subject which has been one of very ancient inquiry. We learn by reading a remarkable case, published more than one century and a half ago, that M. Silvert, surgeon, operated on a tumour of the bursæ of the tendons of the flexor muscles of the fingers, of which case and operation an account is given in the History of the Royal Academy of Science, Paris, in 1717, as follows:—

#### CASE XXXVI.

BURSAL CYST CONTAINING 200 FOREIGN BODIES. (SILVERT'S,  
1717.)

A woman having made an exertion to raise a heavy weight, there appeared on the same day, at the inferior part of her right forearm a small tumour, which gradually increased. The fingers of this hand remained partially flexed, and could not be extended. Finally, at the end of two years, the patient herself determined to have the bursal tumour opened. M. Silvert, surgeon, performed the operation.

There escaped from the opening about two table spoonfuls of glairy serum, and about 200 small white bodies, of a rounded oblong form, like to boiled rice, which small bodies Mr. Raliant demonstrated to the Royal Academy.\*

If we follow up the history of these remarkable bursal tumours to a somewhat later period, viz. 1766, we may convince ourselves that Albinus was well acquainted with the lesion we are here considering. He has himself detailed the following :—

### CASE XXXVII.

ALBINUS, A. D. 1766.

A woman had at the anterior part of her wrist a large flat, soft, indolent tumour, and without any change in the colour of the skin a similar tumour existed in the palm of the hand. If the swelling of the wrist were compressed, that of the palm of the hand became more salient and tense, and reciprocally ; these two tumours really formed but one, divided into two parts, which communicated between them behind the anterior ligament of the carpus, so that when he compressed one part of the sac, the fluid which it contained passed into the other ; this passage was accompanied with a noise — “*Cum surdo quodam strepitu*” — caused by the gliding of these foreign bodies through the narrow opening of communication between the upper and lower por-

\* Academy of Science, A. D. 1717, page 27.

tions of the bursal tumour. An incision made into the prominency above the annular ligament gave issue to a viscid fluid, and to a great number of foreign bodies, and on compressing the palm of the hand the tumour was completely emptied. The wound suppurated, and subsequently healed.\*

These references to cases which have long ago been fully recorded by the Royal Academy of Science of Paris, as well as the account we read of other cases treated by the celebrated English surgeons, Warner and Gooch, prove to us that too much merit has been erroneously attributed to Laennec and Baron Dupuytren, as to their having been, in 1805, the originators of the great attention which the subject of the nature and treatment of bursal tumours of the tendons of the flexor muscles of the finger received at the period, 1805, already specified.

Thus, then, although these eminent men may have gained more applause than they deserved, it cannot, on the other hand, be denied but that the clinical lectures delivered in the Hôtel Dieu in Paris, and the operations performed there by Baron Dupuytren, about the period specified, although not so successful as desirable, still it must be admitted that the Baron's exertions did in reality give a new impulse to the study of the nature and treatment of the very serious lesion we have been adverting to.

\* "B. S. Albini," ch. xv., p. 87.

† "Academ. Annat.," Liber Sept.



Although we may not feel disposed to adopt without reserve the practice of the Baron in treating these cases, we cannot omit to express the opinion that the sentiments of so eminent a surgeon, on such an important point of practice as the treatment of these lesions, are deserving, at least, of being reported and freely discussed.

“These tumours (says Baron Dupuytren) sometimes attain to a size sufficient, in some cases, to interfere with the freedom of the movements of the neighbouring articulations, and even in cases to entirely prevent their movements, and preclude patients from exercising their art or profession, and under such circumstances they demand, on the part of the surgeon, some active measure of his art to be had recourse to.”

We here quote one of his observations :—

### CASE XXXVIII.

(DUPUYTREN'S.)

In the year 1829 a man consulted the Baron on account of a tumour which he had on the anterior part of the wrist joint. This tumour was hard and shining, and of the size of a pigeon's egg ; it was salient not only above, but also beneath the anterior annular ligament of the carpus. Baron Dupuytren considering the position of the tumour, its division into two parts, communicating with each other, and also dwelling on the “*frottement*,” which he could feel, when he sought to obtain

a sense of fluctuation, became convinced of the nature of the case, which he diagnosed as an "hydatid cyst," containing a large quantity of white bodies. A puncture having been made with a bistoury into the portion of the tumour which occupied the palm of the hand, there poured forth a jet of serum, carrying with it a considerable number of white bodies, some rounded, others elongated, of the form and size of pear pippins. A grooved sound introduced into the incision passed up under the anterior annular ligament of the carpus, and a counter-opening was made at the inferior part of the forearm. This second incision gave issue also to serum, and to some small bodies. A dossil of lint was placed in the openings; anti-phlogistic measures adopted, poultices, and afterwards leeches applied. As Dupuytren had foreseen, the inflammatory period was *intense*; but active anti-phlogistic measures, &c., were soon successful, and at the end of a month all the accidents were dissipated. There remained nothing of the disease but some slight rigidity of the articulation.

"Experience (says Baron Dupuytren) has convinced me, as to *the inutility* of the treatment by external measures, such as douches, baths, and frictions of these tumours. To perform the operation of freely opening the cyst, and to induce suppuration of the walls, these (says the Baron) are the only means likely to bring about a cure; but in tumours of this nature, although they may be very little developed, these two measures are not

always unattended with danger. Many patients (the Baron adds) upon whom I have performed the operation of *opening* these tumours, and have thus caused them to *suppurate*, have suffered severely, and some have even died in consequence of the diffuse inflammation which supervened, and which passed up from the hand to the forearm, &c. To verify the last observation, the Baron introduces the case of a patient as follows:—

## CASE XXXIX.

(DUPUYTREN'S.)

A carpenter, aged 35, was admitted into the Hôtel Dieu, June 7, 1814, who had one of these tumours of the bursæ belonging to the tendons of the flexor muscles of the fingers above alluded to. At first the patient had perceived a small tumour in the palm of the right hand, beneath the annular ligament of the wrist, and soon afterwards above this ligament. At first the tumour was small, and by no means inconvenient; soon became large and troublesome, so that it rendered the movements of the hand almost impossible. On this account he sought the advice of Dupuytren, who made an incision into the swelling in the palm, and another into that on the forearm: a large number of small white bodies passed out. With a view to be prepared for the effects of diffuse inflammation and suppuration of the tissues of the forearm, Dupuytren divided freely the palmar fascia and that of the forearm, by means of a buttoned bistoury. The

Baron thought it desirable that inflammation of the walls of the cysts should occur—a seton was introduced, and a poultice applied over all. The patient felt the most acute pains during the night which succeeded to the operation. These pains augmented, accompanied with swelling, on the second, third, and fourth days; then some pus flowed from the wounds. On the fifth day the seton was removed; the constitutional symptoms become more serious. On the eighth day gangrenous sloughs were removed, abscesses formed in the forearm and hand. On the tenth and eleventh days rigors, which lasted ten minutes, occurred. The pus was remarked to be very fetid; general weakness, which resisted all the stimulants which could be exhibited. Death on the fifteenth day after the operation of opening the cysts and evacuation of their contents had been effected.

“Experience first, and reflection afterwards, have proved to me (says Dupuytren) that when one decides on opening one of these bursal tumours, he should make a large incision upon each half of the tumour.”

It should be borne in mind that these enlarged cysts, or bursal tumours, are developed underneath aponeuroses, in the middle of tendons, of vessels of numerous nerves, and in the midst of much fibro-cellular tissue; hence, if we make but a small opening, the swelling produced by suppurative inflammation of the walls of the cyst, almost constantly produces an “internal strangulation” of parts.

The inflammation is propagated more or less at the surrounding structures, along the fibro-cellular sheaths which envelope the vessels and the tendons, whether of the palm of the hand, or of the forearm ; hence there are formed numerous depots of suppuration, and sometimes a diffuse inflammation of the whole limb takes place, and death, as in the case of the carpenter just mentioned.

We avoid, however, certainly (adds the Baron) the most frequent cause of these inflammations, by taking care to open at once, by large incisions, the two halves of the tumour—the one above, and the other below, the annular ligament. Thus no internal strangulation can take place, suppurative inflammation becomes speedily established, and the case terminates favourably. These incisions practised, the liquid evacuated, as well as the numerous bodies the cyst contained, a dossil of lint ought to be introduced between the lips of each wound. I have sometimes (says Baron Dupuytren) passed a seton through the openings ; but (he adds) I have lately laid aside this means, which I have thought not only useless, but even dangerous. All required is to keep merely the lips of the wound apart. The seton introduced into the cavity of the bursa has the inconvenience of exciting too lively a degree of suppuration of the walls of the cyst.

The incision, then, of the cyst, and the production of a suppuration of its walls, are the only means, in the Baron's opinion, which can be thought of as likely to have the effect of obtaining a cure of these bursal tumours we are considering here.

However, it is to be observed, that suppuration of the bursal swelling is not always free from danger ; and that, although the rules laid down here have been strictly attended to, of giving sufficient extent to the incisions recommended, and as to the adoption of means advised to ward off the sources of accidents, still, notwithstanding all the precautions which could have been taken, accidents are stated to have occurred, exposing the life of the patient to danger. While all this is by no means encouraging to operative surgery, it should not be forgotten that in many instances, these bursal tumours of the tendons of the flexor muscles of the fingers of the patient are free from pain, and the complaint is attended with no other inconvenience than that of interfering with the motions of the wrist. The surgeon, then, should not recommend any operation, except when the volume of these tumours becomes distressing to the patient, and prevents him from performing the duties of the art or profession by which he lives. Under such circumstances (says the Baron) the surgeon consulted on this affection ought to persuade his patient (if he can) to put up with the ill the lesion entails on him ; but, nevertheless, if the patient absolutely insists upon an attempt being made to disembarass him of the swelling by an operation, it may then become the duty of the surgeon (after having made the patient well understand the risks he shall have to run) to yield to the wishes of the patient ; and when the operation has been practised, he should hasten, as far

in him lies, to restrain the inflammation within proper limits, should it arise; and, when it becomes intense, he ought to have recourse, with much vigour, to the employment of all the anti-phlogistic measures within his reach.\*

When we refer to the opinions of other eminent French surgeons, relative to the treatment of these tumours of the bursæ of the tendons of the flexor muscles of the fingers, we find Velpeau stating, with great truth with respect to them, that their therapeutics must be considered very delicate, remarking, that—"Any operation performed on them is usually followed by suppuration, and this is very dangerous, often implicating the synovial sheaths of the palm of the hand, as well as those of the forearm, compromising seriously the articulations of the carpus, the integrity of the tendons, and the entire structure of the limb, and even threatening the life of the patient."

Although Velpeau expresses himself thus strongly, he, nevertheless, seems to think that, by the surgeon making a proper selection of his cases for operation, and by his using certain precautions, that the injection of tincture of iodine into these bursal tumours of the tendons of the flexor muscles of the fingers may sometimes be had recourse to, advantageously. "I am now persuaded," he says, "that the dangers attributed to the effects of irritating injections being used in the treatment of ganglions, are really infinitely less than they have been repre-

\* Vol. iii. p. 44, *loc. cit.*

sented, if only care be taken that the puncture for the introduction of the injection be made by a fine trochar, and that the injection be pushed into the cyst of the ganglion only ; and if, instead of warm wine, we make use of a solution of iodine.

“If,” says Velpeau, “the surgeon will only pay due attention to these particulars, very rarely indeed, I will venture to say, shall purulent inflammation be found to follow the plan of treatment by injection of the cyst.”

“Of ten patients I have,” says Velpeau, “subjected to the injection of tincture of iodine, as the treatment for such bursal tumours as we are here considering, in no one instance did fever follow the operation, nor did the inflammation in any case assume either the character of erysipelas or phlegmon, nor was it ever sufficiently high to give me the least inquietude. In all cases the fever began to subside on the fourth or fifth day, and in all the cyst was reduced to a simple insensible nodule towards the fifteenth or twentieth day.”

“The irritation provoked by the iodine injection made through a puncture, which does not permit the fluid to infiltrate the neighbouring tissues, if the fine puncture has been made in such a manner that suppuration of the little cutaneous wound shall not be induced thereby—under such circumstances, in my opinion,” adds Velpeau, “the operation will be found in general free from danger, and I do not hesitate to proclaim it as the best measure which can be adopted in many of these cases.”



Chassaignac seems to me to have been the latest among the French surgeons who has occupied himself with the consideration of this lesion, which we have been adverting to, under the head of synovial tumours, developed in the bursæ of the tendons of the flexor muscles of the fingers.

With respect to their treatment, this author adds his testimony to that of others, as to the danger which usually results from the use of the seton, or of making any incision into the bursa, if the opening permit the penetration of the atmospheric air into their cavities. Chassaignac recommends us to adopt Velpeau's plan of injecting tincture of iodine into the cavity of the bursal swelling, as safer than any other mode of treatment he is aware of. He adduces the following :—

### CASE XL.

CHASSAIGNAC'S CASE—INJECTION OF TINCTURE OF IODINE—  
RESULT—ADHESIVE INFLAMMATION—RADICAL CURE.

A patient was operated on by M. Chassaignac in the Hôtel Dieu, on the 14th of February, 1845, by the injection of tincture of iodine into the cavity of the bursæ of the tendons of the flexor muscles of the fingers, in front of the wrist. *One* opening only was made, by the passing of a trochar into the palmar portion of the sac of the hygroma, and some tincture of iodine was injected into it. Adhesive inflammation followed, and the patient was cured.

About six months afterwards the patient became attacked with disease in his chest, and died. On making the *post mortem* examination, it appeared that the original cavity of the bursal swelling had disappeared; adhesive inflammation had taken place, and hence the cure of the bursal tumour had been proved to have been radical.\*

While it thus appears, in the treatment of the swellings of the bursæ of the tendons of the flexor muscles of the fingers, that, on the one hand, these swellings are often found to be very innocent—remaining stationary for years; on the other, that they may become very inconvenient to the patient, and that, therefore, with a view to disembarass him of the disease, he has been sometimes advised to submit to extensive incisions being made into these bursal tumours. Under these circumstances, it becomes a matter of much importance for us to inquire into, whether these incisions, which have been recommended and occasionally practised, have been found safe and efficacious in remedying these deep bursal tumours of the front of the wrist? For my own part, I cannot express myself favourable to extensive incisions into these bursal tumours of the wrist, as a probable means of effecting their cure.

The operation recommended in these cases by some, has been frequently had recourse to, but I am persuaded that their results have not been hitherto

\* Soc. de Chirurgie, Avril 15, 1846.

fully reported in these cases, so as to enable us to judge how far we should be guided by them.

As to this point of full evidence being still required as to the result of extensive incisions in the cases in question, I may here mention that, in the immediately preceding pages in this volume, I have stated a case of one of these deep bursal tumours, which was situated in front of the wrist, in which such violent inflammation and suppuration followed the opening of the bursal tumour, that, finally, amputation became necessary.\* My colleague, Mr. John Hamilton, states† that he had seen an instance where such violent inflammation and suppuration followed the opening of the ganglion in the front of the wrist beneath the annular ligament, that, finally, amputation above the elbow had to be performed. He adds that Sir Philip Crampton mentioned to him a similar case.

There can be no doubt but that it is to this species of bursal tumour of the wrist to which Sir Benjamin Brodie alludes when he speaks of the opening of a synovial swelling of the wrist, containing foreign bodies. He says:—"When loose bodies have been found in the cavity of a bursa, these may in themselves be sufficient to keep up the formation of fluid. Under these circumstances," he continues, "the first step towards a cure is to puncture the bursa, so as to allow these loose bodies to

\* See page 448 of this volume, Fig. 41; and also, "British Medical and Surgical Journal," July, 1871.

† See "British Medical and Surgical Journal," July 29, 1871.

escape. But this operation," says the Baronet, "simple as it appears to be, is to be performed with the greatest caution. The suppuration of a bursa under any other circumstances may be productive of very serious inconvenience, if not of actual mischief, and should not be artificially induced." And again, he further observes, "if it be expedient to make a large opening into the cavity of the bursa, all undue pressure and rude manipulation should be carefully avoided, and means should be employed in keeping the parts in complete repose afterwards." If these precautions be neglected, active inflammation may ensue, terminating in extensive suppuration, and producing great constitutional disturbance. Sir Benjamin Brodie concludes by observing—"I have known more than one instance in which the death of the patient was the ultimate result of such an operation."\*

Notwithstanding the unfortunate result of incisions, which had been made into bursal tumours of the wrist, containing loose bodies, which had thus come under his own notice, the Baronet, under certain circumstances, still advised *incisions* or punctures to be made into bursal cysts of the wrist, containing foreign bodies—due precautions being taken in the operation. But for my part I must say, that I should always fear that any incision made into one of those bursal tumours of the wrist, of the species we are here considering, must be

\* "Brodie on the Joints," 1850, page 397.

almost of a certainty followed by suppurative inflammation of the bursal cyst, and that, therefore, they should be avoided.

Sir Benjamin Brodie asserts that the existence of loose bodies in the cyst of a bursal tumour of the wrist becomes a sufficient cause to keep up the formation of fluid, and that, therefore, the first step towards a cure in such a case is to make an opening to allow the loose bodies to escape. With this opinion I cannot concur, for I believe many of these bursal tumours, including the foreign bodies they contain, may disappear under treatment—in some cases, the inflammation of the bursal cyst undergoing resolution; in others, the inflammatory action assumes the adhesive form, and causes the interior surface of the bursal cyst to coalesce with each other, and thus a cure is effected. Under any of these circumstances the general bursal swelling will altogether disappear, as well as the loose rounded bodies it had contained within it.

To prove that these small loose bodies, so frequently contained in these deep bursal tumours of the wrist, will disappear under treatment, without any opening being made to allow of their escape, I may mention that a man named John Davis was lately under my care in the Richmond Hospital,\* who had a well-marked bursal tumour of the front of the wrist, developed in the bursæ of the tendons of the flexor muscles of the fingers; and the exami-

\* Case XLI., page 525.

nation of the tumour in this case by the touch demonstrated the characteristic *frottement*, announcing the presence within the cyst of loose bodies floating. This case of bursal tumour, under simple treatment, and without any puncture or incision, subsided altogether—neither *frottement* nor any evidence whatsoever of any vestige of foreign bodies remaining in the cyst of the bursal tumour of the wrist.

In this case of John Davis,\* we have before us an example to prove that it is not always essential to make an opening to evacuate the loose bodies usually found contained in these bursal tumours; but, on the contrary, learn that, if the inflammation of the bursal cyst subsides, the loose bodies will disappear.

We may here allude to the observations as to this point made by Chassaignac and Velpeau. The former says that, in his case of successful treatment of a bursal tumour in front of the wrist, containing foreign bodies, by injection of iodine :—“ When the swelling had been cured, no *frottement* was evident. No foreign or loose bodies were to be discovered remaining in the situation of the former cyst; and yet, in this case any opening which had been made was merely sufficient to permit the escape of a little serum only. The bursal swelling of the front of the wrist had subsided, the loose bodies had become absorbed, and the disease was radically cured.”

\* See page 525.

To prove the same point of the possibility of the small "loose bodies" becoming spontaneously absorbed after the bursal tumour of the wrist had been cured by injection of iodine, Velpeau has distinctly informed us that, out of five of his cases of bursal tumours, he was happy to cure by injection of iodine, he did not find it was necessary to interfere with the loose bodies at all, but after the injection he left them to absorption, which in each of the five cases actually occurred.

Among French surgeons we do not, in their latest publications, find many advocates for extensive incisions in these special cases of bursal tumours of the wrist. M. Velpeau, who has been known to have devoted much attention to this subject, expresses himself strongly on the matter as follows:—

"Whether, like Champion, we confine our treatment to very small incisions followed by compression: whether, after the example of Gooch, Dupuytren, Warner, that we cleave largely the synovial sac, including (if it must be) the anterior ligament of the carpus: or whether we limit our operation, as Richerand and others have done, to the extent of one or two lines made into one of the prominences of the tumour, the operation (no matter how varied) is always to be apprehended as one likely to be followed by frightful consequences."\*

\* "Dictionnaire de Medecine," tom. Vingt-cinq.

Upon the subject of the treatment of these bursal tumours (of the species we are here considering), by *incisions*, Velpeau says:—"They are," he thinks, "more dangerous than irritating injections. This," he adds, "being also the experience of others, may, perhaps, afford a reason for these incisions not being much employed by modern surgeons. I am convinced," he adds, "that the dangers hitherto feared as likely to be the result of the use of irritating injections, in the treatment of ganglions, are infinitely less than they have been supposed to be, if only the puncture be judiciously made with a *fine trochar*, and if the injection be pushed into the cyst of the bursal tumour only, and if, also, instead of warm wine, the surgeon makes use of tincture of iodine for the injection." From the result of an injection into the bursal cyst as just recommended, Velpeau says:—"I find but very rarely indeed does any purulent inflammation arise."

"I may mention," he says, "that of ten patients with whom I have tried the iodine injection, not one of them suffered fever. In none has the inflammation which came on been sufficiently intense to give me the least cause of anxiety for the safety of the patient. In all, it has commenced to become less on the fifth day, and, in all, the irritation produced by iodine injection made through a puncture which does not permit of the fluid infiltrating the neighbouring tissues, nor cause the small wound of the integuments to suppurate." Under such good precautions as are here suggested, Velpeau



looks upon the injection of the bursal tumour formed in the synovial membrane of the flexor muscles of the fingers as a remedy devoid of danger, and also efficacious. He concludes his praise of this treatment by saying:—"I do not hesitate to proclaim treatment by the injection of iodine as the best of all the means we can propose in these cases, if only the cyst be at all of the proper form for the injection."

Chassaignac has expressed his opinion as to the best mode of treating these bursal tumours in front of the wrist, which we have here alluded to, under the term of tumours of the synovial membrane of the bursa of the tendons of the flexor muscles of the fingers. This bursal swelling Chassaignac denominates an *Hygroma bisacculaire* of the wrist.

With respect to it, he observes:—"If it be left to itself it increases slowly, but the result which commonly follows is, that the upper extremity of the patient affected with this lesion is rendered useless. In consequence of the fingers having been for a long time kept flexed, they become permanently stiffened in this position. Every method of treatment," says Chassaignac, "which gives rise to suppurative inflammation of the hygroma, exposes the patient to most intense reactional symptoms, and, in most cases, to serious consequences. Whenever any opening is made into the cavity of one of these hygromas, which has the effect of permitting the free entrance of atmo-

spheric air, will, of necessity, induce suppuration of the cyst." Chassaignac concludes by observing that, encouraged by the success which attended Velpeau's treatment, by iodine injections, of the cysts of bursal tumours somewhat similar to the hygroma, in bringing about *adhesive* inflammation of their interior, and producing a radical cure, he determined to make use of these iodine injections in the treatment of cases affected with *palmar hygroma* of the wrist.

Chassaignac, in his operation by injection of the iodine, mentions that he made only one opening by the trochar into the bursal tumour. The great object he proposed to himself, by the injection of iodine, was, to excite inflammation enough in the walls of the cyst, to the extent of producing (not suppurative but *adhesive*) inflammation only, as in the case of the operation for the radical cure of hydrocele.

With such views he operated, by means of the injection of iodine, in one case of hygroma of the wrist, on the 14th of February, 1845, in the Hotel Dieu de Paris, and with complete success.

The two following cases of tumours appearing on the front of the wrist, in the bursæ, the tendons of the flexor muscles of the fingers, and which cases were lately under observation in the Richmond

\* "Soc. de Chirurgie," 15 Avril, 1846; Dict. des Sciences, tom. x.

Hospital, may serve to exemplify somewhat the occasional course and ultimate result of such cases :—

### CASE XLI.

ACUTE CASE OF SWELLING OF THE BURSAE, OF THE TENDONS OF THE FLEXOR MUSCLES OF THE FINGERS, WITH THE USUAL SYMPTOMS, "FROTTEMENT," ETC.—TREATMENT: REST, ANTIPHLOGISTIC MEASURES, LEECHES—RECOVERY PERFECT, IN LESS THAN ONE MONTH.

On the 15th of July, 1870, John Davis, aged 63, a whitewasher, was admitted into the Richmond Hospital, under my care. He had, for the last ten days, suffered from pain and swelling in the right wrist, which prevented him following his ordinary occupation. He stated he had previously enjoyed excellent health. On examining his wrist, it was seen that an oblong swelling occupied the lower part and front of it, and extended down to the centre of the palm of the hand. This swelling was constricted transversely, in the site of the annular ligament of the carpus. Apparently two swellings were formed, the one above the annular ligament, the other below the level of its lower edge. Whenever these prominences in the wrist and in the palm were manipulated, with a view to ascertain whether fluctuation existed, this was not only made manifest, but, at the same time, a remarkable *frottement* was elicited by the passing from the upper part of the bursal swelling into the lower part of it (the synovial fluid carrying

with it, no doubt, the usual small rounded corpuscles). The wrist was swollen, and the integuments hot, but by no means red. The palmar prominency was tense, and the fingers moderately flexed. If the patient wished to extend the fingers, the effort was attended with pain, and the extending of them by another could not be borne. There was not any constitutional disturbance.

*Treatment.*—It was directed that six leeches should be immediately applied to the swellings in front of the wrist, and that the orifices they made should be allowed to bleed freely, for some time, into a warm poultice. The patient was ordered to remain in bed, and to have a warm bath three times a week.

16th July.—The leeches have bled freely; the swelling, heat, and pain of the wrist are much reduced. The patient can now, he says, extend and flex his fingers, the movement causing him much less pain than heretofore.

Barton's (American) splint was applied to support the hand and wrist, and maintain complete immobility of the joints. The splint was maintained by a roller, and the patient allowed to leave his bed and to move about, his forearm being supported by a sling. He was kept on a strict antiphlogistic plan of diet and treatment. He improved daily, so that the report of his case on the 2nd of August, the eighteenth day after his admission, was as follows:—

. "Since last report, Davis has improved much in

every respect. The swelling, heat, &c., have diminished considerably: the fingers can now be flexed and extended without causing any pain to the patient; the further treatment consisting principally in maintaining immobility of the hand and forearm by means of the hand splint and bandage, which was most successful; so that, on the 2nd of August, he was so well that he was allowed to leave the hospital. No swelling of the wrist, no *frottement* nor evidence of foreign bodies whatever remained."

On the 25th of May he presented himself at the Richmond Hospital, and it was noticed, as very remarkable, that no swelling, no heat, no contraction, nor pain of the fingers existed. Mr. Vesey, the senior resident pupil of the hospital, saw Davis on February 17, 1871, and informs me that he has perfect use of his hand.

## CASE XLII.

CASE OF TUMOUR FORMED BY EFFUSION OF SYNOVIAL FLUID INTO THE BURSE OF THE TENDONS OF THE FLEXOR MUSCLES OF THE FINGERS—SUPPURATIVE INFLAMMATION OF THE CYST—COMPLETE DISORGANIZATION OF VARIOUS STRUCTURES OF THE FOREARM, RENDERING AMPUTATION A NECESSITY.

Mary O'Brien, aged 37, unmarried, laundress, admitted into the Richmond Hospital under the care of Dr. Stokes, on the 13th of March, 1868. She sought to be relieved from a bursal tumour,

formed by the distention by synovial fluid of the bursæ of the tendons of the flexor muscles of the fingers—now in a state of inflammation from a recent injury. An oblong tumour was seen extending from the front and lower part of the region of the left wrist, from above the annular ligament down to the palm of the hand, where it was seen and felt to be very prominent. This oblong tumour seemed to be constricted transversely at the site of the annular ligament of the wrist, and to present two prominences—one *above*, in the forearm, and the other *below*, in the palm. Pressure which diminished the prominence of one swelling increased that of the other. While manipulating the oblong swellings, the usual *frottement* was perceived, indicating that “rice-like” bodies floating in synovial fluid existed in the cyst. The patient complained of pains of a stinging character in her forearm and hand. Her middle and ring fingers were somewhat contracted—any attempt to straighten them gave pain.

In addition to the ordinary signs of which these swellings which occupy the bursæ of the tendons of the flexor muscles of the fingers usually present, it was recently observed (March, 1868) that a new fluctuating tumour, about the size of a pigeon's egg, and situated above the level of the wrist, existed in the front of the forearm, near to its ulnar side. The surface of the skin presented no redness, but the fluctuating swelling, ever since the accidental sprain and contusion she lately met with, was extremely painful to her.

These were the symptoms Mary O'Brien laboured under on the 13th of March, 1868, when she was admitted into the Richmond Hospital, under the care of Dr. Stokes. It should be mentioned that the *previous history* of her case was well known in the hospital: for, at a period of seven years previously, viz, in 1861, on three occasions, she came to the hospital to be treated for a chronic inflammation of the same bursal tumour—she being at that time twenty-nine years of age. The treatment was always very simple, consisting in the application of leeches, the adoption of antiphlogistic measures; the affected wrist to be kept in perfect repose. Her symptoms on each occasion soon yielded to this simple management, but, in consequence of her own obstinacy and inattention to orders, she suffered two relapses. At length, however, on the 2nd of June, 1861, she was considered to be so well that she might safely leave the hospital—after her discharge from which, on the 2nd of June, 1861, she remained so far well, for some years, as to be able to support herself as a laundress. Unfortunately, one day in March, 1868, she met with a severe sprain, accompanied with a contusion, in her formerly affected wrist, and by which she was rendered completely unable to make any use of her hand, and was, therefore, admitted, on the 13th of May, 1868, into the Richmond Hospital.

Such were the present symptoms and the previous history of Mary O'Brien's case, when she was placed, for the first time, under Dr. Stokes' care,

who informs us, as to the treatment of her case at that time, that he adopted various means with a view of lessening pain and arresting the progress of the disease, without having any good effect on the tumour, which became more and more painful. An explorative puncture with a cataract needle was made into the prominent tumour on the fore-arm, and it having been thus ascertained that the fluid it contained was purulent matter, this was then evacuated. More acute symptoms of inflammation supervened, which no mode of treatment was found capable of restraining; and the suppuration was so extensive that there was, Dr. Stokes remarks, "no course left but to lay open the tumour freely." After this, the most violent symptoms followed. Large abscesses formed in the hand and various structures of the fore-arm, under the fascia, which had to be freely divided, and the abscesses opened as they formed; the inflammation and suppuration were increasing in intensity and extent, and rapidly exhausting the patient. The various textures, viz., the muscles, tendons, nerves, and vessels, &c., of the fore-arm and hand were completely disorganized. "Under such circumstances," says Dr. Stokes, "amputation of the fore-arm became necessary, and was performed at the distance of a hand's breadth below the elbow. After the operation, the suppuration was small, and the healing process proceeded with great rapidity."\*

In these two cases, the inflammation of the sy-

\* "Dublin Quarterly Journal of Medical Science," February, 1870.



novial membrane of the bursæ of the tendons of the flexor muscles of the fingers had commenced in similar structures, and occupied corresponding regions of the wrist and palm; but, in the one case—that of Mary O'Brien—the disease was eminently chronic, occupying a period of nine years, during which she was more or less affected: whereas, in the case of John Davis, its duration, from its commencement to its successful termination in a cure, occupied five weeks only.

The necessity for a lengthened period of observation of this case of Mary O'Brien, whether she was treated as an intern patient in hospital, or as an extern dispensary case, was plainly attributable to the patient's own neglect of the rules laid down for her; and hence the relapses she suffered, and the long duration of her illness. Although for a period, after leaving the hospital in 1861, she was able to return to her work as a laundress, still, I am persuaded that always some weakness of the formerly affected wrist remained, which rendered her susceptible of fresh attacks of inflammation from any extra work or sprain. A sprain, accompanied with a contusion of the wrist, did actually occur, just before her last admission into hospital, and this became the fresh starting-point of a more acute attack of inflammation of the bursal tumour than ever had before affected it; and although, on this occasion, the inflammation was promptly met by Dr. Stokes, by free incisions and the evacuation of matter, the limb could not be saved.

TREATMENT OF BURSAL TUMOURS DEVELOPED IN THE VICINITY OF THE JOINTS OF THE LOWER EXTREMITY.

1. *Knee, Bursa in Front of the Patella.*—A morbid condition of the bursa in front of the patella frequently calls for surgical attention.

As in this case, the interior of the bursal tumour never has any communication with the synovial cavity of the knee joint, it would appear, that a free incision into the bursal tumour may at once be safely made, and the contents be fully evacuated, without any danger of the synovial sac of the knee being injuriously affected by this incision. Sir Benjamin Brodie recommends, for the treatment of this lesion, that the bursal swelling should be opened and the cavity dressed with lint: it would appear that he had not entire confidence in this simple treatment, for he thought it necessary to supplement his advice, as to the free incision, by further recommending the occasional use of a few threads, to be passed through the tumour in the mode of a seton; "a good deal of inflammation," he observes, "has followed from this operation, but it has never been productive of further ill consequences."

One of the latest writers on the treatment of enlarged bursæ situated over the patella, Mr. William Savory, Surgeon to St. Bartholomew's Hospital, dwells on the variety and difference of

modern opinions on the subject of their\* treatment. He says, "it is necessary to recall only the numerous and very various plans of treatment, which have been proposed and practised by surgery, to show that there is, as yet, no single method generally recognized, as at once safe and sure." The plan that Mr. Savory proposes is, "to puncture enlarged bursæ situated over the patella with a lancet or small knife, in its most prominent part; all its contents are carefully expressed, and then it is subjected to firm pressure by a pad of lint and strapping, and bandage, so that the walls may everywhere be kept in contact, and the cavity obliterated : " this method," he adds, "is simple, safe, almost painless, and when thoroughly carried out rarely fails."

So far back as March 28th, 1846, I laid before a Meeting of the Pathological Society of Dublin cases of enlarged bursæ situated over the patella. These cases were accompanied with Plaster of Paris casts, proving the size the enlarged bursæ had attained in the cases in question.

*Operation.*—The plan of treatment I had adopted in these cases I laid before the Society consisted in plunging a long straight-edged bistoury directly into the cavity of the enlarged bursa at its highest part, and thence carrying it out below, making a longitudinal incision downwards to the very lowest part of the bursal tumour ; 2ndly, in evacuating fully the fluid, and other contents of the enlarged bursa;

\* St. Bartholomew's Hospital Reports, Vol. ii. 1866.

and, 3rdly, in dressing the cavity from the bottom of the wound. I may perhaps be permitted to give here an abstract of one of these cases I laid before the Society, with a view to exemplify more fully the plan pursued.

### CASE XLIII.

BURSAL TUMOUR AS LARGE AS AN ORANGE, SITUATED OVER THE RIGHT PATELLA, TREATED BY A LONGITUDINAL FREE INCISION FROM ABOVE DOWNWARDS THROUGHOUT ITS WHOLE EXTENT—COMPLETE EVACUATION OF THE CONTENTS OF THE BURSAL TUMOUR—RECOVERY.

Mary Moran, aged 28, a housemaid, had a chronic bursal tumour as large as an orange, situated over the right patella. She had, sometime previously to her application to me, consulted my friend and former pupil, Dr. Power, who was induced, at the patient's request, to try a palliative plan of treatment at her own home, by puncturing the swelling and letting off as much of its contents as he could; but this treatment having failed to remedy the disease, the patient was transferred, by Dr. Power's desire, to my care in the Richmond Hospital. On the 19th February, 1846, I made a free longitudinal incision from above downwards into the large tumour over the patella; this gave immediate exit to about three ounces of a brown oily fluid, which in passing out carried with it shreds of lymph and numerous small white bodies like boiled rice. The walls of the bursa seemed to be three

lines in thickness, and the interior surface of the cyst was remarkably smooth and yellow, like the interior of the aorta. Towards the back part of the cyst, where it covered the patella, were seen large transparent bands of yellow tissue passing transversely. One of these bands was an inch in length, of a cylindrical shape, and fully as large as a goose quill. I exhibited one of these portions of yellow tissue which we had considered advisable to remove from the cyst, to which we found it adherent by its extremities, whilst the rest of its surface, like some of the *carneæ columnæ* of the heart, was free all round. Besides these transverse bands, there were also rounded cartilaginous-like bodies, as large as peas, attached by slender pedicles to the interior of the cyst; all these bodies were removed and exhibited. As in this case the enlarged bursa had caused such a prominency of the patella, and the skin had become so flaccid and pendulous in front, we could scarcely hope that, in the healing of the longitudinal incision, the skin could contract enough to prevent a bulging deformity remaining. We therefore thought it advisable to expose and remove an elliptical portion of the anterior and flaccid wall of the thick bursal cyst: this was done accordingly. The wound was next dressed from the bottom with lint soaked in almond oil. There was no constitutional disturbance whatsoever followed immediately, or subsequently: suppuration was soon fully established, and the wound was cicatrized so that the patient was enabled to leave hos-

pital on the 29th of March, perfectly well. It was truly surprising how much the thick cyst had softened down, and how small was the prominency of skin in front of the patella when the longitudinal wound was healed. In conclusion, I may repeat here, what I stated to the Meeting of the Pathological Society, that, in my opinion, the operation of making a free longitudinal incision was much to be preferred to punctures of the enlarged bursa, by a lancet or small knife, or to punctures supplemented by the insertion of a few threads in the manner of a seton ; and I am of opinion that any operation which shall leave behind in the bursal cysts these rounded and pedunculated cartilaginous bodies, or transverse bands, are likely to fail in radically curing the disease; because when these irregular-shaped bodies are pressed upon, when the patient kneels, new irritation and inflammation must arise, and cause a recurrence of the disease.

In the report of the observations I made at the meeting of the Society already mentioned, I have stated another great advantage of the free incisions and dressing above described, namely, that no constitutional disturbance follows in these cases. We find, on the contrary, that punctures, simple subcutaneous incisions, or even thread setons, are very generally followed by active inflammation and suppuration of the diseased bursa, and are attended with much *fever* and constitutional disturbance, during which there are bad secretions

from the interior surface of the bursal cysts formed, and the pus in these cases becomes remarkably fetid, and the constitutional symptoms do not yield until the fetid pus and accompanying gaseous contents of the inflamed bursal cyst are evacuated freely. These evils do not arise when the mode of proceeding above recommended has been fully carried out.

2. Besides this subcutaneous bursal tumour of the patella, there is occasionally to be observed another bursal tumour near the knee, and also occupying the middle line, but very deeply situated between the under surface of the triceps extensor of the leg, and the front of the lower extremity of the femur. The bursa, sometimes the seat of such a tumour, is the sub-crural, and we find that this bursa has not attracted much attention from anatomists or pathologists. Mr. Tatam,\* however, has not failed to make the remark, that he has seen a large bursal tumour under the vasti. We may mention that Dr. Alexander Monro has, in his work on the "Bursæ† Mucosæ," published many years ago, two cases of tumours of this bursa; and with respect to these cases he thus expresses himself:—"In the course of the present year, 1786, I was consulted by *two* patients, with a considerable collection of synovia within the bursa which is behind the insertion of the

\* Holmes' System of Surgery, Vol. iii., p. 653.

† A Description of all the Bursæ, by A. Monro, page 36, Edinburgh, 1876.

triceps extensor of the leg into the patella. In both, after the application of discussing liquors, and blisters had been tried in vain, the fluid was drawn off by a lancet-shaped trochar passed obliquely, with a view of excluding air. In one case the operation was palliative only, and was not attended with inflammation or pain; but in the other case, the whole knee inflamed violently, and suppurated, probably from the restlessness of the patient and admission of the air; so that the amputation of the limb became unavoidable.\* Any communication from such an authority calls for our attention, but we do not, in my opinion, derive any encouragement to repeat the operation of *Monro*, viz.—“That of opening the dilated cyst by means of a lancet-shaped trochar, passed obliquely with a view of excavating the contents of the cyst without the admission of air.” Indeed it appears to us that such an operation must always prove hazardous, and that any urgent necessity for such a measure is not likely to arise.

TREATMENT OF BURSAL TUMOURS SITUATED ON THE  
LATERAL ASPECT OF THE KNEE-JOINT.

3. The bursæ we observe in the lateral aspect of the knee-joint are more frequently seen prominent towards the internal aspect of the knee-joint than externally; and we may here make the remark, that those bursal swellings which are placed on the

\* See page 359, *Monro*, loco cit.



external and lateral aspect of the knee seldom are found to communicate with the interior of the synovial sac of the knee-joint, whilst those which are placed internally and posteriorly, as the larger bursa of the semi-membranosus, usually do.\*

Sir William Lawrence gives us from his own experience a case of bursal swelling which was situated at the internal side of the knee-joint, and the treatment he adopted had a happy result.†

#### CASE XLIV.

The baronet says, "that about three weeks ago, a gentleman thirty years of age consulted me for a swelling in the inner side of the right knee, a little below the joint. It was nearly as large as a walnut, and had all the character of a ganglion. I burst the cyst by means of a sharp blow with a stick, and its contents were diffused in the surrounding cellular substance. The cyst did not fill again. This must have been a ganglion connected with the bursal apparatus of the flexor tendons, where they play on the tibia."

Sir W. Lawrence has adopted, by this subcutaneous bursting of a synovial tumour, a mode of proceeding which must be considered the safest. He endeavoured to make this mode of thus treating bursal tumours more general. He had a patient, between

\* See page 452.

† See "London Medical Times and Gazette," Vol. xxi., 1838.

30 and 40, who followed the occupation of a blacksmith, under his care, as an out-door patient of the hospital. He had a swelling in the ham (similar to that of George Brooke, page 459), causing a little stiffness and lameness, but no other inconvenience. Sir W. Lawrence attempted to burst the cyst by striking it, but could not accomplish this object, as the tumour having been surrounded by soft parts, yielded, and thus eluded the effects of the blow. In reply to some inquiries forwarded to a number of hospital surgeons, by the editor of the "British Medical Journal" relative to the treatment of bursal tumours found in the neighbourhood of the joints, we read one communication made to him by Mr. Poland, of Guy's Hospital, giving the account of the following case:—

#### CASE XLV.

##### BURSAL SWELLING SITUATED BEHIND THE INNER HAM-STRING TENDON OF THE RIGHT KNEE.

"William L., aged 17, was admitted with a tumour behind the inner ham-string tendon of the right knee. It was two inches in vertical direction, and an inch and a-half across. It was very elastic, and gave a sensation of fluctuation. It could not be made to diminish in size, and did not seem to have any connexion with the knee-joint, although it seemed close upon it. He stated that it had been growing eighteen months; that he had never re-

ceived any injury ; that it had caused but little inconvenience or pain. He had used this leg more especially to set the lathe in motion, he being a brass-finisher. A straight outside splint was applied, to keep the knee fixed, and iodine ointment applied. In the course of a fortnight, the tumour not having diminished, it was explored, when some gelatinous clear substance exuded, similar to what is found in ganglion at the back of the wrist. The tumour was then freely laid open, and the whole of the gelatinous contents completely emptied out. Pressure was then applied, and the knee kept perfectly stiff by the splint. The sac never refilled, and the patient left in all respects perfectly cured. The case was evidently one of ganglion in connexion with the insertion of the semi-membranous tendon.\*\*

As, in Mr. Poland's case, the bursa which was cut into and emptied had no communication with the knee-joint, the opening of the bursa was done without risk. We, under all the circumstances of the case, may conclude that it was the *smaller* (see page 453) bursa of the semi-membranosus, which we know does not communicate with the knee-joint, that was here dealt with.

Let me, however, caution the young practitioner that, previously to his undertaking the opening of any bursal tumour in the vicinity of the inner ham-string, to have clearly ascertained, as Mr.

\* The "British Medical Journal," Vol. 2, July, 1871, page 64.

Poland seems to have done, that no communication existed between the interior of the cavity of the bursa he was about to cut into, and that of the knee-joint.

#### BURSAL SWELLING IN THE POPLITEAL SPACE.

A bursal swelling in the popliteal space may appear as the result of a sprain or other accident, or it may supervene as a consequence of an attack of idiopathic synovitis, acute or chronic. We have seen the popliteal bursa affected alone, without there being any implication with the special synovial sac of the knee-joint, and consequently without there being any other swelling in front, or any appearance of hyarthrosis. Occasionally, however, the bursa, which has been converted into a fluctuating tumour in the popliteal space by inflammatory action, has itself been excited by some local cause or accident, such as a sprain. Under these circumstances, if the patient be constitutionally predisposed to gout, to rheumatism, or to rheumatic gout, one of these three forms of inflammatory action may become developed in the popliteal space.

As to gout, Sir William Lawrence, in his lecture on fibrous cysts of the ham, thus expresses himself: "These swellings of the ham are not uncommon; I have seen an instance of it in a gentleman of a *gouty* habit, between 50 and 60, who had inflammation of the synovial membrane of the knee, from an accident."

As to rheumatic gout I may, from my own rather recent experience, bring forward the following case:—

### CASE XLVI.

A BURSAL TUMOUR OF THE HAM, SYMPTOMATIC OF CHRONIC RHEUMATIC ARTHRITIS.

Mr. G. P., a barrister, *æt.* 50, a healthy-looking and vigorous man, having had previously slight but very evident symptoms of rheumatic gout in his elbows, such as pains with some crepitation on motion, in these joints, one day, June 8th, 1871, when rising suddenly from the floor, upon which he had been kneeling, sprained his right knee most severely; and very soon after this accident occurred, he called upon me, and complained of considerable pain in his right ham, where there was to be observed a prominent swelling about the size of a pigeon's egg, situated nearer to the inner than outer ham-string muscle. On moderate flexion of the knee, the bursal tumour became soft and flaccid, while, on the contrary, when the limb was extended as fully as it could be, the popliteal tumour became remarkably tense. When these symptoms were taken into account, with the previous history of the case, the nature of the fluctuating tumour thus became evident, *viz.*, that it was a bursal tumour of the ham, symptomatic of chronic rheumatic arthritis of the knee, a lesion to which the patient had

been predisposed, but the immediate determining cause of which, no doubt, was an accident. On another account, the case seems specially worthy of observation, because the immediate effect of the sprain was such that the patient could not fully extend the knee, and when he attempted to walk he could not place his heel on the ground ; in a word, he seemed to suffer all the symptoms and disabilities of a patient who had met with the accident denominated by Hey "*an internal derangement of the knee,*" and at once the case suggested to us the idea, that the "internal derangement" might be speedily remedied by our adopting a similar mechanical mode of treatment to that in general so successfully had recourse to, in cases of the internal derangement of the knee described by Hey. I therefore appointed a meeting with Mr. Elliott, surgeon to the Whitworth Hospital, Drumcondra, and I requested him to assist me in applying forcible extension (to be followed immediately by sudden and full flexion of the limb), to remedy the "internal derangement" the knee seemed to have sustained in this instance.

The patient, therefore, was placed on his back on a large dining-table, with the flexure of the ham corresponding to the level of the lower margin of the table ; and after extension having been fully made for some time, and then suddenly relaxed, as full a flexion of the knee as was possible was immediately had recourse to. As to the immediate good effect of this measure on the condition of the limb, we can report that at the moment nothing

seemed more satisfactory ; for upon removing all the appliances of extension, and making the patient walk, we were much gratified to see that the use of the limb seemed to be fully restored. The patient could extend it completely, and place his foot flat on the ground, and walk without lameness or pain ; in a word, the patient seemed quite as favourably affected by the forcible extension and flexion of the limb, above described, as we have ever seen any patient to have been, by similar treatment in a case of "Hey's internal derangement of the knee." As a proof of the immediate (but I am sorry to say only temporary) good, resulting from the plan here adopted, I may mention that the patient had been brought to my house in a carriage, but that after having been subjected to our mechanical treatment, he found himself having such perfect use of his limb that he insisted upon walking home from my house to his own, a distance of about one mile and a half, and neither during the time of walking, nor for some time afterwards, did he feel any uneasiness whatsoever. However, after Mr. Elliott and I had had the satisfaction of seeing all this apparent good result of our operation ; I am sorry to say that, late in the evening, after his return home, the patient felt so confident as to the completeness of his recovery from the effects of the accident, that he had the imprudence to make the attempt to demonstrate to his friends how perfect was the restoration of the use of his limb ; but, while making some great movement of his right knee, an internal de-

rangement, accompanied with the former inability to place the heel on the ground, again suddenly occurred.

It was not considered, now, advisable to have again recourse to any further mechanical treatment, but to depend upon rest, the application of leeches and antiphlogistic measures. In the course of a month the patient seemed to be perfectly free from pain, and to have had restored to him the entire use of his limb; but ever since the occurrence of the sprain, the bursal tumour, though in a passive state, still remains prominent, and about the size of a pigeon's egg, in the popliteal space.

Besides the treatment of the case already detailed, it should be also mentioned that Mr. P. was subjected to a course of medical treatment consisting principally in the use of the Chelsea Pensioner electuary.

In September, 1871, although Mr. P. seemed not only convalescent, but really well, yet lest there might possibly still be lingering in the system some latent remains of, or predisposition to, rheumatic gout, I strongly urged him to take a course of warm baths, to spend some weeks at Aix les Baines, Aix la Chapelle, or at Harrowgate. He went to the latter place, where he spent one month. He called upon me on his return to Dublin, and when I examined his right popliteal region, I found there still existed in the ham a prominent swelling, the size of a pigeon's egg. This swelling was pain-



less, and the patient now enjoyed the perfect use of his limbs. The elbow-joints, as heretofore, crepitated on motion, but this caused no inconvenience to the patient.

#### OBSERVATIONS ON THE CASE.

As to what could have been the cause of the sudden and peculiar lameness, and other symptoms, which simulated so much those belonging to the accident denominated by Hey "an internal derangement of the knee," must be in reality a matter of conjecture: but when we bear in mind how commonly are found, in the knee-joints of patients, who had been affected with rheumatic gout, pendulous cartilages, or "foreign bodies," we think we may naturally suspect that, in this case of Mr. P., some such pendulous bodies existed within the knee-joint, and that in certain movements of the articulation, some of these small bodies must have interposed themselves between the condyles of the femur and tibia at the moment the sudden lameness occurred.

In concluding this case of bursal tumour of the ham, accompanied with sudden lameness and symptoms resembling those "of Hey's internal derangement of the knee," I may observe that this is not the first time in which a similitude between the symptoms of "Hey's internal derangement of the knee" with those which belong to the signs of the existence within the joint, of loose cartilages and

excrescences, has been noticed ; for Sir Benjamin Brodie, in his chapter "on loose cartilages, and excrescences within the joints," says, "the symptoms produced by a loose cartilage within the joint of the knee much resemble those which characterize the signs of Hey's internal derangement of the knee.'" \*

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And here let me pause, and desist for a moment from pursuing the subject of bursal tumours of the ham, until I have briefly adverted to that of foreign bodies, contained within the knee-joint, symptomatic of rheumatic gout, a subject the present consideration of which is here suggested to us by the case of Mr. P. just related.

And it may not be amiss to observe that although Sir Benjamin Brodie has written one chapter on rheumatic gout, and another on loose cartilages within the joints, he has not, in either of these chapters, remarked that the existence within the joints of *loose cartilages* gave any evidence of the patient in such a case having been affected with rheumatic gout. He admits that, in two instances, he has known exostotic growths, detached from the articular surfaces ; observing that, in those two cases, this preternatural growth of bone had taken place, and in consequence of the motion of the parts on each other, portions of it had been broken off and lay loose in the cavity of the joints; from which it would

\* Brodie on the Joints, fifth edition, p. 262.

appear that these two cases were the only examples he has ever met with of any case of rheumatic gout in which he had observed loose bodies floating within the joints of a patient affected with rheumatic gout.

It would appear to me that not only Sir Benjamin Brodie, but that the profession in general, has been slow to express the opinion that foreign bodies or loose cartilages within the joints belonged to the symptoms of rheumatic gout. Although this subject may have been thus treated in these countries, it has not been so in France ; for I can refer to important observations on this matter by M. Cruveilhier, and to facts collected by him in the wards of the Hospital Salpêtrière in Paris, and which have been published in his large work on Pathological Anatomy. Cruveilhier did not appear to have been acquainted with any observations made on the disease before his time, nor the name given to it in England by Haygarth, viz., nodosity of the joints, but he studied it, as he found it in nature, and suggested a name for it, viz., *Usure des cartilages Articulaires*, which the profession did not adopt, nor consider suitable.\* Yet there is no doubt, but that the disease which Sir Benjamin Brodie adverts to, in his fifth edition, as rheumatic gout, and which I had denominated chronic rheumatic arthritis, is the same identical disease (no matter what the name we choose to give to it), which Cruveilhier

\* See p. 3, present edition.

has well described in his work on Pathological Anatomy (Livraison IX., Plate VI.),—here he has delineated an elbow and knee-joint affected with (let us call it) rheumatic gout, containing foreign bodies, some loose in the cavity of the joints, others appended to their interior surfaces by slender membranous pedicles. We also notice in his drawings the characteristic marks of the disease, such as the eburnation of articular surfaces, the grooves in the direction of the ordinary movements the joint enjoyed. In this plate (VI.) the bones of the elbow and knee-joints seem somewhat changed from their normal form: the margins of their articular surfaces are studded round with granular, exostotic growths; and as to the synovial membrane of the joints, it is red, and the fimbriæ are all delineated as in an hyperemied condition. On the whole, this graphic delineation portrays all the anatomical characters of chronic rheumatic arthritis, including numerous foreign bodies within the elbow and knee-joints.

As to my own opinion relative to loose cartilages within the cavity of the joints, and as to the question whether they should be considered symptomatic of rheumatic gout, I have to say that many years ago (1839), having been called upon to write in the London Cyclopædia of Anatomy, the article *Elbow-joint, abnormal condition of*,\* I then produced examples of these joints affected

\* Vol. II., p. 79.

with chronic rheumatic arthritis, which were stated to have contained within their cavities foreign bodies ; in some cases they were few, but in one example I adduced, there were forty foreign bodies observed to have been contained in one elbow-joint affected with chronic rheumatic arthritis.

Although it has never occurred to Sir Benjamin Brodie to express any opinion as to loose cartilages and foreign bodies being symptomatic of rheumatic gout, and in which I have endeavoured to show he has been somewhat remiss, there can be no doubt that he has made important observations on the general symptoms, and as to the treatment that those loose cartilages require, which deserve to be quoted. As to the symptoms, Sir Benjamin Brodie says, "a patient complains that occasionally, in walking, he is seized with sudden pain in the knee, the leg at the same time being fixed at a particular angle ; with more or less difficulty he contrives to regain the mobility of the leg, and, when he has done so, he discovers a hard solid body lying generally beside the patella, on one of the condyles of the femur. There is no doubt that in such a case the symptoms are best explained by supposing that the solid body in question is moveable in the joint, and that it occasionally slips in, between the articulating surfaces:" he adds, "such loose cartilages in the joints, but more especially in the knee-joints, are not uncommon." "I attended," he continues, "a gentleman who laboured under this troublesome disease, and

in whom the loose bodies not unfrequently slipped between the articular surfaces of the knee, occasioning an almost immediate swelling of the joint, with the most excruciating pain and tenderness, and with symptomatic fever. In one instance, more than one month elapsed before these symptoms had subsided. In this case, five loose cartilages were extracted by three distinct operations, without the slightest inconvenience occurring in any one of them. Sometimes there is only one of these loose bodies in the joint, but frequently there are two or more and occasionally they are still more numerous.”\*

The Baronet further adds, “In a preparation contained in the Pathological Museum of St. George’s Hospital, these substances (loose cartilages) are seen in the various stages of their progress ; there are seven of them in all,” &c.†

In my opinion, there is much reason to believe that some of these cases, brought forward by Sir Benjamin Brodie as cases simply of loose bodies contained within the cavity of the joint, were really loose cartilages symptomatic of chronic rheumatic arthritis, of which they were the product.

The Baronet recommends us to endeavour to remedy the inconveniences which loose cartilages within the joints produce ; first, by palliative measures, such as bandages, and if these fail, he adds, there is no remedy but the removal of the cartilage or cartilages, “by an incision into the joint.”

\* Page 251, *loc. cit.*

† See Brodie on the Joints, 5th ed., p. 261.

Let me, however, here observe, that the surgeon should have made himself certain of the correctness of his diagnosis, in such cases, and that chronic rheumatic arthritis does not exist in the joint, before he proceeds to have recourse to active surgical measures ; for although there are many surgeons who would not hesitate to cut into the joint to remove loose cartilages, in the ordinary simple case the Baronet contemplates, yet, on the other hand, I believe that there are few acquainted with the anatomical characters of rheumatic gout would venture to brave the results of an incision into a joint affected with this disease—for under such circumstances, the hyperemied condition of the synovial structures, known to prevail in these cases (Plate XI.), would seem to forbid incisions to be made into the cavity of a joint so affected, whether it be to inject a fluid into a bursal swelling, or remove a loose cartilage.

In resuming our observations on popliteal cysts, we have again to revert to Foucher's memoir in the "Archives Generales," which Nelaton designates as a very important one. Foucher has there called attention to an anatomical peculiarity of the larger bursa of the semimembranosus, which consists in the bursa having a species of valvular opening by which it communicates with the interior of the synovial sac of the knee-joint. The margins of this little aperture overlap, and perform the office of a valve. Foucher says that, in dissection, he fully exposed the interior of the knee-joint in front ; he

turned down or inverted the patella, and thus exposed to his view the small opening in question, by which the larger bursa of the semimembranosus communicated with the synovial sac of the knee; while he thus kept the small opening in view, he directed that the knee should be alternately flexed and extended by an assistant; which having been done, it was observed that, in flexion, the opening was pervious, but when the limb was rigidly extended, the opening was hermetically closed.

Foucher having stated these preliminaries, informs us that Velpeau had under his care, in the Hospital La Charité (June 28, 1856), a man aged 54, who had a voluminous bursal tumour in the ham. Velpeau, apparently wishing to turn the discovery of Foucher to a practical account, performed the following operation, in this case of a distended popliteal cyst. He having placed the patient on his face, the limb destined to be operated on was kept in a state of complete extension. Velpeau then penetrated the distended bursal tumour by means of a trochar. Three spoonfuls of a thick glairy fluid were given exit to; some tincture of iodine, a little more in quantity than that which had been withdrawn, was then injected through the canula: this little operation caused but little pain. The tincture of iodine injected was left for some minutes in contact with the interior of the little sac of the bursa. This operation was performed on the 25th of July. Some pain, inflammation, and fever followed, with local swelling for some days. On



the 5th of August the pain had disappeared, and the swelling in the knee had diminished in volume. During the following days the swelling continued to decrease, and on the 30th of August, a little more than a month from the moment that the operation was performed, the patient left the Hospital La Charité,\* considering himself cured.

Nelaton's observations on the treatment of bursal tumours of the ham are a few years later (1859) than those of Foucher, but they seem to agree very much with each other. As to simple *incisions* and *punctures*, they consider them useless; "they empty the sac, but the swellings are not slow to return, and it then becomes necessary to irritate the interior of the cyst, either with the end of a grooved director, as M. Lavry has done, or by means of an iodine injection;" and Nelaton adds—"It is to this last means he would give the preference, taking care that, when in the act of injecting the bursal cyst, the limb be carefully preserved in the state of complete extension, lest that, in the case operated upon, some communication between the bursal cyst and synovial sac of the joint existed."†

As to *excision* of a bursal swelling of the ham, this operation, he adds, has been twice practised by Malgaigne; but Nelaton objects to this method as painful, and adds that the *excision* of the cyst must prove difficult, in consequence of the adhesion which is known to exist between the bursal sac and the

\* Archives, de Medica, vol. xi., p. 319.

† "Pathologie Chirurgicale," tom. 3. Paris, 1839.

ligaments, and the tendons of the muscles which form the borders of the popliteal region.

We should not have omitted to notice also Foucher's comments on M. Malgaigne's operations of excision of the popliteal bursæ, in which he has thus expressed himself :—

“Malgaigne laid bare the popliteal cyst, by an incision in the integuments ; he excised a considerable portion of the cyst, and the patient (after having passed through the dangers of a suppuration, which lasted nearly two months) got well.” “This mode of proceeding,” adds Foucher, “is not exempt from danger, and, although more expeditious than other modes, ought not to be adopted but in exceptional cases.”

Although the eminent authorities we have just quoted do not seem to have considered bursal tumours of the ham to constitute a serious affection, nevertheless, they do not hesitate to recommend very hazardous operations to be undertaken, with the expectation of effecting their cure. As to my own opinion on the treatment of bursal tumours of the ham, by surgical operations, it accords entirely with the sentiments expressed by Sir William Laurence in his lecture to his clinical class at St. Bartholomew's Hospital, on “Fibrous Cysts in the Ham,”—that as dangerous consequences have ensued from operations performed on such affections, which in themselves are quite free from danger, and constitute an inconvenience only, “no dangerous method of treatment should be adopted.”

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